NATIONAL CAR BUILDER

VOLUME XIV.
NUMBER 2.

DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

$1.00 PER ANNUM
SINGLE NUMBERS, TEN CENTS.

NEW YORK:
Morse Building, 140 Nassau St.

FEBRUARY, 1883.

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CHICAGO:
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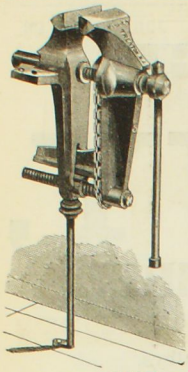

Our NO. 6 VISE opens 10 inches, with 8-inch Jaws; has solid forged screws 1¾ inch diameter, with 36-inch lever. We make 5 smaller sizes of same pattern. Special discounts to R. R. Companies and Car Companies on application.

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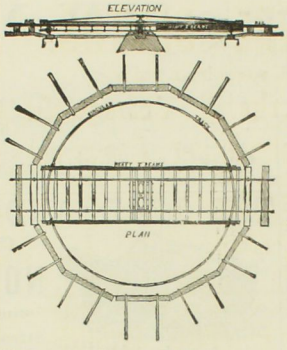

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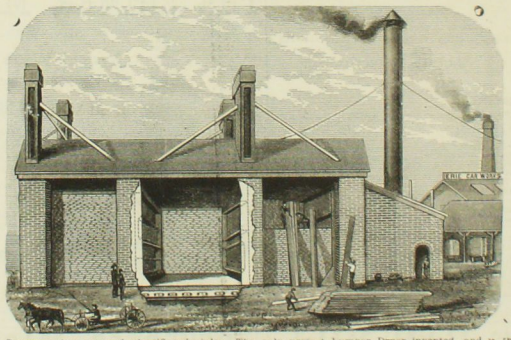

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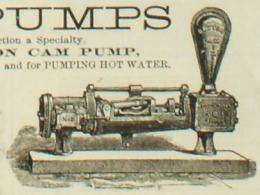

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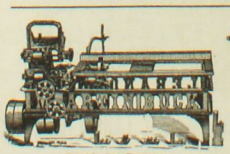

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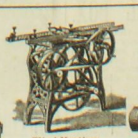

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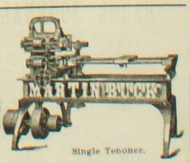

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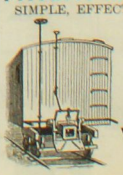

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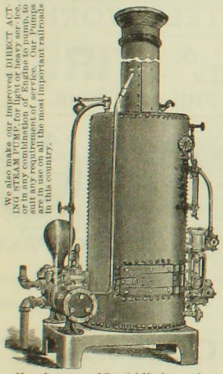

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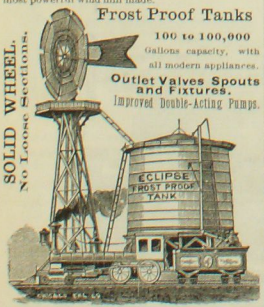

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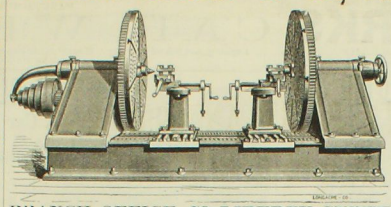

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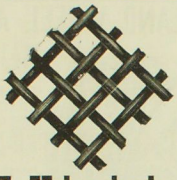

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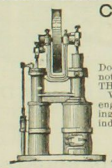

Does not require a special attendant; the station agent or any employé can run it (cannot explode); is extremely simple, and the pump is easier to repair THAN ANY IN THE WORLD.

When vertical distance from water to top of tank does not exceed 40 feet the 6-inch engine will pump 1,200 gallons and the 10-inch engine 3,500 gallons per hour, consuming only five and ten pounds of coal respectively. THIS WE GUARANTEE. Used and indorsed by nearly 200 railroads. For particulars and illustrated catalogues apply to

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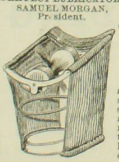

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Spiral Spring four and a half inches high, four inches in diameter, fastened to a malleable iron top, containing a roller with bristles transversely inserted, the sides of the spring covered with felt and having one of the lips formed of the same material; when in position the outer edges of the concave roller are pressed against the surface of axles, the motion of which causes the roller and bristles to revolve and to distribute the oil in proportion to the velocity of the axles while the sides of felt saturated with oil act as "wipers" and lubricators; and the end lip performs similar duties, preventing waste of oil and the entrance of grit and dust.

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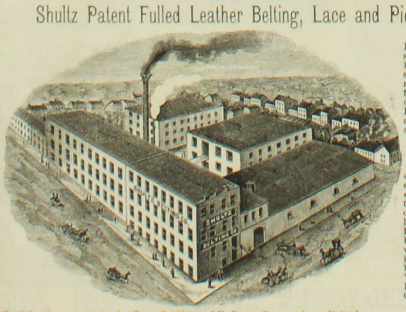
Shultz Patent Fulled Leather Belting, Lace and Picker Leather.



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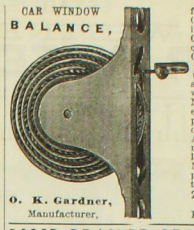

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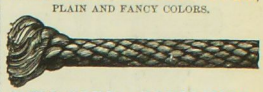

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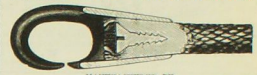

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STEEL CAR PUSHER

Made entirely of STEEL.
One Man with it can easily move a loaded car. *Will not slip on ice or grease.* For sale by
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Boiler Tubes, Plate Iron and Steel Boilers, Tanks Machinists' Tools, Locomotive Frames, Crank-Pins Axles, Head Lights, Steam Gauges, Car Wheels Etc., Etc.

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GALENA
ENGINE, COACH AND CAR OIL.
Gravity, 26°, 27°, 28°, 29°. Cold Test, 10° to 15° below zero.

No freezing in coldest weather, and entire freedom from hot journals at any time, as its exclusive use upon a majority of the leading railroads has demonstrated.

Showing Better Results than any Oil Extant.
REFERENCES FURNISHED ON APPLICATION.
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BRADLEY'S Insulated Air Covering

(Made of Asbestos and Soft Feltings.)

For Boilers, Steam, Hot-Air, Gas and Water Pipes To prevent the Condensation of Steam and the contents of Gas and Water Pipes from freezing.

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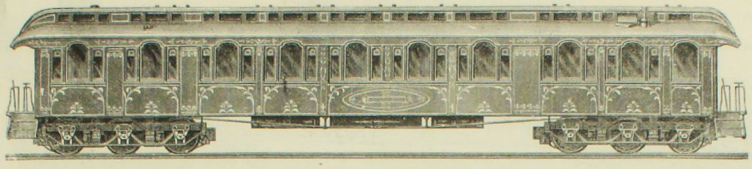

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VOLUME XIV
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FEBRUARY, 1883.

SINGLE NUMBERS, TEN CENTS.
$1.00 PER ANNUM.

Miscellaneous Items.

THE Erie Car Works have in their yards 10,000,000 feet of pine lumber to be made up into cars.

T. H. PAUL & SONS, of Cumberland, Md., are building new locomotive works at Baltimore, and will employ from 400 to 500 men.

THE Woodruff Sleeping Car Co. has been re-organized as the Woodruff Car Trust Co., with an authorized capital of $3,000,000.

THE cable system for street railways has proved eminently successful in Chicago. Over 20 miles of it are now in operation in that city.

THE Hinkley Locomotive Co., Boston, Mass., has recently shipped five locomotives to the Panama Canal Co., and two to the Addison & North Pennsylvania railroad.

THE Chicago Tyre & Spring Works now have a daily capacity of 25 tons, and employ 50 men in the manufacture of cast steel car steel springs of every description.

THE new works of the Baltimore Car Wheel Company, now in process of erection at Baltimore, will cover nearly ten acres of ground, and will have a capacity of 400 car wheels per day.

MR. W. R. CRUMPTON, recently Division Superintendent on the Chicago, Burlington & Quincy road, has formed a connection with the American Brake Co., of St. Louis, and takes charge of the Chicago office.

THE Mallinckrodt automatic freight car brake has been successfully tested on the Marietta & Cincinnati road. Other trials are to follow in order to thoroughly test the invention before introducing it to the public.

THE opinion is expressed by many of the officers of locomotive contract companies, that although there will be plenty for them to do this year, the margins of profit will be very close and the competition extremely active.

THE Burton Stock Car Co. has contracted with the Wason Manufacturing Co., Springfield, Mass., for the building of a number of stock cars. They will have the suspension car truck, double elliptic springs and Janney couplers.

MR. HENRY M. CLAFLIN, late President of the Cleveland Bridge and Car Works, is now largely engaged upon contracts with the city of Cleveland for paving the streets with stone in place of the worn out Nicholson wood pavement.

EVERY 24 hours 115 passenger trains and about 120 freight trains pass through Newark, N. J., on the Pennsylvania Railroad. The freight trains are made up on an average of 34 cars, so that in a day over 4,000 cars go over the line. The total number of passenger cars run in the same time is 750.

THE Pennsylvania railroad has, through one of its employes, patented an effective railroad crossing for the purpose of preventing a collision should approaching trains on either road reach the crossing at the same time. For this purpose four curved turn-outs are provided in the four angles made by the crossing tracks. The switches of these turn-outs are so arranged and connected by rods and cranks that by the movement of a single lever, if one line is set for the passage of a train, the switch rails to the other line are so set that a train approaching it will be conducted to a turn-out siding, so that if two trains on the crossing lines approach the crossing at the same time, one will pass on to its destination while the other will wait or be switched off on its turn-out.

THE Schenectady Locomotive Works are full of orders, and are obliged to run in the night time, which is done to advantage by the use of electric lights. The orders in hand are for 40 8-wheel freight engines, with 17x24 cylinders and 5 ft. drivers, for the New York Central & Hudson River road; 20 engines of same dimensions for the Chicago & Northwestern, and 15 for the Chicago & Alton; also 15 consolidation, 20x24 cylinders and 48 in. drivers, for the Pine Creek road; 2 consolidation 20x24 cylinders, and 6 8-wheel 18x24 cylinders, for the Kentucky Central; and 6 10-wheel 18x24 cylinders and 48 in. drivers, for the Chesapeake & Ohio & Southwestern. The works now turn out 20 engines per month, not counting a mogul or 10-wheel engine as one and a half, as some builders do. The number turned out last year was 185, actual count. The shells of the boilers are riveted by steam, and is an improvement upon hand-riveting. Extensive additions to the shops are in progress, and the number of men now employed is 1,050.

THE Brooks Locomotive Works, at Dunkirk, turn out an average of 18 engines a month, and are filling orders for 15 moguls for the Chicago & Atlantic, 15 consolidation for the Rochester & Pittsburg, and 15 eight-wheel engines for the St. Paul, Minneapolis & Manitoba road. Standard templets are used which secure thoroughly interchangeable parts. A new locomotive frame slotter has been in use at these works for some time. It has three heads, which allows work to proceed on all three pairs of jaws of a mogul frame simultaneously. Solid male and female gauges take the place of adjustable calipers, thus insuring that what is called an inch hole to-day is the same hole for all time. These gauges are kept to size by means of a set of master gauges made expressly for these works by the Whitworth Co. A novel feature of these works is a school room, which has been fitted up over the offices, for the instruction of their apprentices in mechanical knowledge. A graduate of an eastern technical school has been engaged as instructor

THE machine used in the manufacture of railway spikes by H. H. Fowler & Co., Chicago, consists of two large rolls, mounted in substantial housings, and driven by gearing after the manner of ordinary bar rolls. The center of these rolls contains a groove in which the forming dies are placed. These are twelve in number, are made of special grade of steel and contain the imprint of the spike. The spike, after being rolled into the groove, is forced out by the plunger actuated by interior methods. The rolls are driven at such a speed that the radius of the roll is not assumed by the spike, but it leaves the roll substantially straight. The speed also has the effect of forming the spike, as it were, by a blow. The entire operation of producing the spike consists merely of taking from the furnace the hot billet, about two inches square, running it through but four passes, after which it is fed direct into the spike-forming rolls, from which the spikes drop out automatically, at the rate of twelve per revolution. The machine is capable of turning out from 600 to 1,200 finished spikes continuously per minute, depending upon the rate of speed at which the machine is run.

THE Harlan & Hollingsworth Co., of Wilmington, Delaware, has recently completed for the Canadian Pacific railway two parlor cars, that are represented to be the handsomest structures of their kind ye tbuilt. They are 60 ft. long and 9 ft 10¼ in. wide, and the length, including platforms, is 66 ft. 4 in. The inside of the bodies is paneled in solid mahogany, ornamented with gold, and picked in with black and delicate touches of vermilion. On each side there are nine large plate-glass windows, 34×48 in. The cars are divided transversely into five sections, the center one for the parlor, a smoking room at each end, with ladies' and gents' wash rooms, linen locker, heater, etc., intervening. The heater pipes pass along the entire length of the cars, and are gold bronzed. The parlors are lighted by ten of the large windows, and furnished with 20 revolving chairs of solid mahogany, inlaid with marquetry mainly in neutral tints, the figures being exquisite designs of flowers, vines, insects, birds and conventional forms. Throughout the cars the ceiling is of oak veneer, with painted decorations in Japanese and other graceful figures. The smoking rooms have walls of solid San Domingo mahogany with rosewood trimmings. The ventilating, lighting and heating arrangements are as near perfect as they can be made. The cars are to run between Montreal and Winnipeg.

AT the New York Central shops, at West Albany, 13 fifty-foot baggage cars are in course of construction, also one standard passenger coach, and two combination passenger cars. These latter are 54 feet long. The 13 baggage cars have 4-wheel trucks with Paige's 42-inch wheels, wheel base 8 feet. In the paint shop 35 coaches are being repainted. The dimensions of this shop are such that with all these cars in it, it appears quite empty. No less than 350 tons of hard coal are required to keep it properly warmed during the winter. Mr. Hoit, the master car-builder in charge of the shops, has adopted a plan for strengthening the floor-framing of passenger cars by making the intermediate sills, next to the side sills, in the form of an arch, by cutting them longer than the distance between the end sills, and then springing them into place, the outside of the camber being next to the inside of the side sills. He is also fitting up a baggage car with preservatories, ice chests, and a coal box to carry five tons of coal, the car being designed to form a part of Mr. Vanderbilt's personal train to San Francisco. Mr. Hoit is also designing a hopper-bottom coal dump car, which we hope to be able to illustrate soon. In the locomotive department 16 engines are undergoing repairs. The shops employ in the aggregate, including engineers and firemen, 1,214 men, and the monthly pay-roll averages $72,517. Mr. Van Vorst, the superintendent of the locomotive department, has been connected with the road more than 40 years.

THE Boston & Albany shops, at Springfield, Mass., are overhauling 12 engines. The standard freight engines of the road are 8-wheeled, 20×26 cylinders, and 54-inch drivers. An attachment is used to throw part of the weight of the tender on the engine. Mr. Underhill, the Master Mechanic, prefers 8-wheel engines for all road service, considering them equal to moguls, besides being cheaper to build and easier on the track and themselves. The road's standard passenger engines have 18×24 cylinders and 66-inch drivers. Mr. Underhill advocates high boiler pressure, and the results in the matter of economy justify his preference. His standard pressure is 160 pounds per square inch. He also uses on his freight engines 1×10-inch ports, which seem very small, but indicator diagrams prove them to be sufficiently large. He is about to build a new compound freight engine, which will have the high pressure cylinder directly in front of the low pressure one, and both in the usual position of outside connected cylinders. The valves of both will be controlled by the ordinary link gear, and the same degree of expansion will take place in both. Mr. U. is of the opinion that a great obstacle to high speed is the bluff front of an engine, and the consequent atmospheric resistence, and thinks the laws which govern the forms of vessels might be extended with advantage to cars and locomotives.

THE Wason Manufacturing Co., at Springfield, Mass, are building 14 passenger cars for the Boston & Providence road, length 45 and 48 feet, 4-wheel trucks, 33-inch wheels, and finished in oak, cherry and walnut; 1 51-foot passenger car for the Providence, Warren & Bristol; 6 of same length for the Maine Central; 6 for the Southeastern of Canada, 48 feet long, with 4-wheel trucks, 42 inch English wheels, and also 2 combination cars; 2 passenger and 1 combination for the Portland and Ogdensburg; 1 passenger for the St. John & Maine; 6 passenger and 50 horse cars for the Connecticut River; and 2 drawing-room cars for the Housatonic road. The company is just shipping 25 of a lot of 100 dump cars to the Panama Canal Co. These works use what is known as the "common sense" kiln for drying lumber, by which the sap in green timber is brought to the surface by sweating with live steam. After this, the steam is shut off and made to circulate through pipes next the floor, the atmosphere in the kiln absorbing the heat from the pipes to about 115°, when the air is drawn out at the top by fans, and forced through a cylinder in which cold water circulates through a coil of pipe, condensing the moisture absorbed from the timber. This air is again introduced at the bottom of the kiln, reheated and drawn out as before. Three condensers are used, out of which runs a half-inch stream of the condensed moisture and sap. By this process the lumber is rendered equal if not superior to that which is air-dried in the ordinary way. Mr. Pierce, who designs the head-linings for cars for these works and for J. L. Howard & Co., in Hartford, has made a new departure in this branch of ornamentation which is very effective, but which must be seen to be appreciated. The Wason Co. employs at present about 350 men, and are turning out about 12 cars per month, although their capacity is about one passenger car a day.

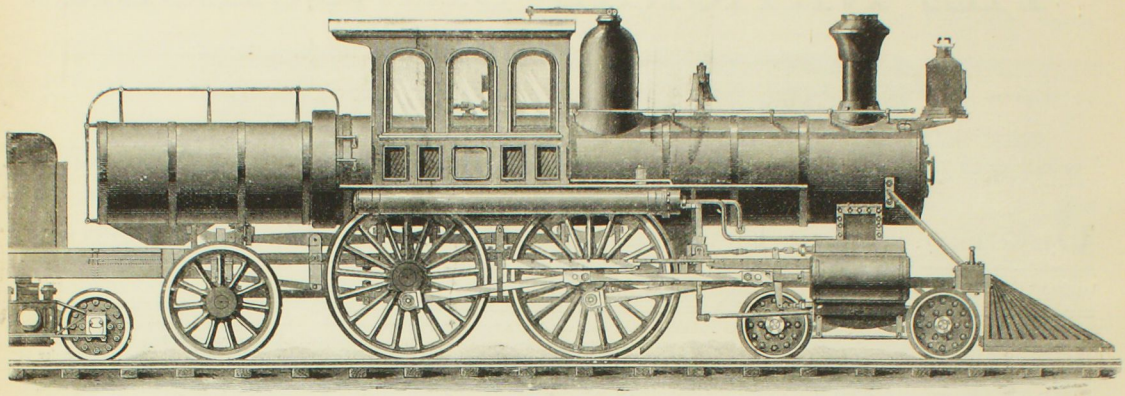


FIG. 5. STRONG'S EXPRESS LOCOMOTIVE, WITH DOUBLE FIRE BOX.

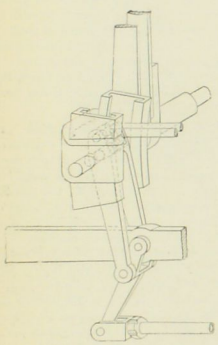


Fig. 4. The Links.

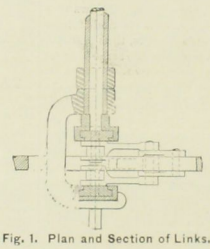


Fig. 1. Plan and Section of Links.

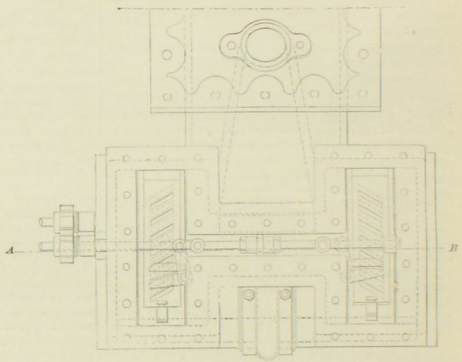


Fig. 2. Top View of Valve, Cover Removed.

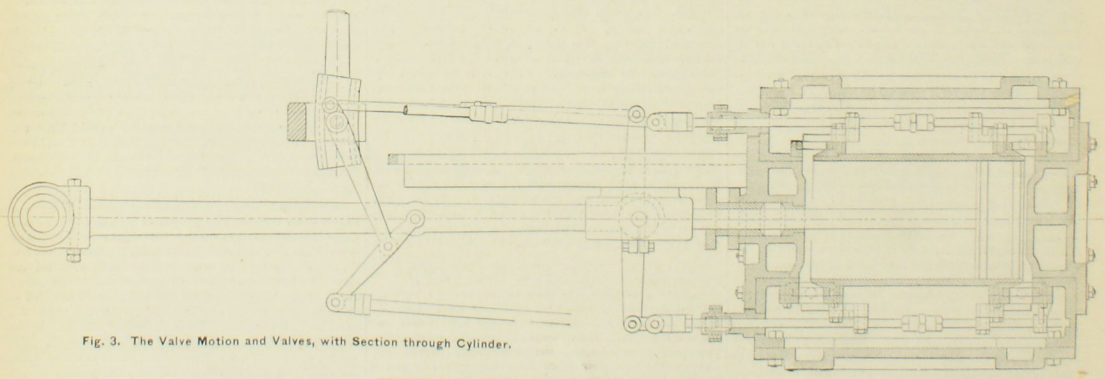


Fig. 3. The Valve Motion and Valves, with Section through Cylinder.

STRONG'S EXPRESS LOCOMOTIVE VALVE GEAR.

THE engravings illustrate important improvements in locomotive boilers and valve gear, designed by Mr. George S. Strong, of Philadelphia.

The following description is from the *Iron Age*:

The valve motion is a modification of the Joy valve-gear, but arranged to work steam and exhaust-valves independently, in order to obtain any desired point of cut-off without affecting the exhaust. Incidently, this dividing the valve practically into four pieces enables clearance to be cut down to only 5 per cent. A reduction in clearance is an advantage not to be despised, since indirectly it has an important influence on the back pressure. In expanding, the terminal pressure is much reduced, and hence less steam has to find its way through the exhaust ports than in cases where the clearance amounts to 20 or 30 per cent., as is often the case. The cushion is only sufficient to bring the temperature up to the equivalent of boiler pressure, and it is not necessary to close the exhaust valve so early on the return stroke to do this as it would be with an engine having a large clearance. In other words, a shorter and sharper curve is obtained on the return stroke than is necessary when there are large clearances that have to be filled. This, of course, gives a much smarter engine, with a short cut-off, and there is therefore a higher rate of economy. In other words, the engine has more power for a given size of cylinder. At high rates of speed the tendency of the early exhaust closure is to hold back the engine, materially reducing the power developed. The locomotive engineer never wants a governor on his engine, and though it might be easy to control an engine by the cut-off valves, as was proposed by Professor Thurston, that would hardly be a desirable method of operation in the locomotive. How this small clearance is accomplished is best seen by reference to Fig. 3, which represents a longitudinal section through the center of the cylinder.

Fig. 2 shows a top view of the valve-chest with the cover removed. It will be seen that there are at each end of the cylinder two short, straight ports. Each one of these ports is covered by a gridiron valve moving crosswise of the cylinder. In the valve the port openings are cut at an angle to the length, so that a short transverse motion gives a wide opening to the ports, of which there are a number. Steam and exhaust valves are similar in arrangement and position, though the latter are placed beneath the cylinder. The gear consists of two box-links facing each other, see Figs. 1 and 4. These are driven by a system of levers like that used in the Joy gear, from a point on the connecting-rod. The angle at which these blocks are set determines the points at which the valves open and close. One of them governs the exhaust and the other the steam valves. One of them is held in a yoke carried on a hollow shaft. Through this hollow shaft passes another shaft and holds the opposite link.

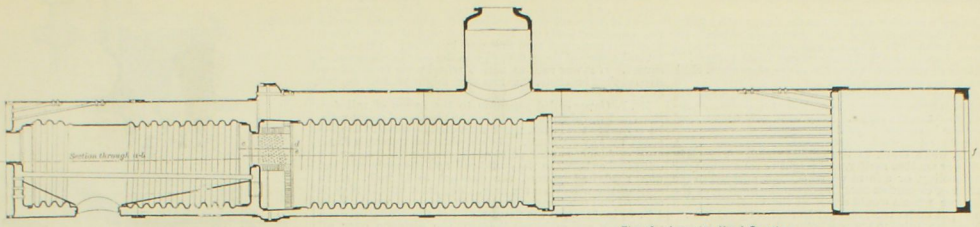


Fig. 6. Longitudinal Section.

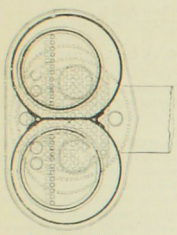


Fig. 7. End View.

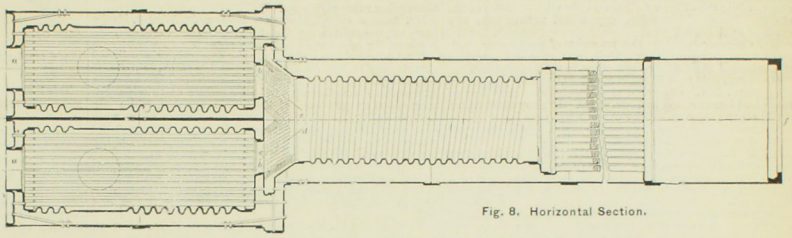


Fig. 8. Horizontal Section.

STRONG'S EXPRESS LOCOMOTIVE BOILER.

Each link, of course, carries on a sliding block. There are two levers for reversing the motion that are connected to their corresponding levers in the cab. One of these levers is attached to the yoke, while the other is connected with the shaft. The steam-valve is moved by the link-block working in the link on the yoke. The result of this combination is that the engineer can, by setting either of these links at any desired angle, alter the point of compression or of cut-off to suit himself. The valves are of the gridiron type, as already stated, and move crosswise the cylinder; but, while the openings are very large, the travel of the valve is very slight, amounting to only its lap and opening, and the motion is so arranged that the valve moves only when it is in balance. One induction valve is standing still while the other is moving; in other words, they neither of them have to travel any unnecessary distance simply to accommodate the other end, as is the case with the ordinary D-valve. As the compression is arranged to reach nearly or quite to boiler pressure, it is easy to see that when these valves move they move practically in equilibrium, and the pressure on the back is simply that which is necessary to keep them tight when not in motion. With the ordinary valve the case is quite different, since while one end may be in equilibrium the other may be exposed to the full pressure of steam on the opposite side, or may perhaps be fairly lifted off its seat for an instant by excessive compression. No small proportion of the unequal wear of valve-seats is attributed by engineers to this unequal pressure. Gridiron valves, however, when carefully made and worked in connection with a proper amount of compression, are singularly free from this objection. With the exhaust valve the conditions are almost precisely similar; they move only at the end of the stroke when the steam pressure which they have to resist has been greatly reduced, and they remain idle during most of the time when there is any considerable pressure within the cylinder. The valves are moved by a sort of bell-crank driven from the valve-stem in connection with a wiper which moves in such a way that the valve is started without any shock of contact, and opens and closes as smoothly as if its motion had been continuous, like that of an eccentric or the lever of a Joy valve-gear. This arrangement of course obviates any necessity of balancing, and gives the best balance possible if the valve has enough load to keep its seat.

The valve is kept in contact with the wiper or rocker from which it gets its motion by a neat little device consisting of a small piston working in a cylinder. This is shown at the lower end of the valve in Fig. 2. The piston is connected with the valve by a T-shaped head in such a way that it can rise freely. By connecting the cylinder with the outer air, and putting a cock into the opening, the operation is made certain under all conditions. This device has worked very successfully on automatic cut-off engines, and is neatly adapted to the work of keeping the valve in contact with the toe by which it is moved. The exhaust valves being located on the under side of the cylinder, the drainage may be expected to be perfect at all times, as the water flows naturally into the exhaust cavity, where it is trapped. The cylinders are steam-jacketed, with a jacket cast on, but expansion is allowed for by separating the outer shell into two parts and connecting it by an expansion ring, as shown in Fig. 2.

The engine to which this valve motion is applied is as remarkable in almost every respect as the valve-gear itself. One of the first features which has caused comment on Mr. Strong's designs is the abolition of the parallel rod and the substitution therefor of a prolongation of the piston rod, together with an additional slide and an extra connecting-rod. There are, then, two connecting-rods—one for each wheel. The guide is placed outside of the forward driver, and is coupled to the main crossheads by a straight bar, which of course moves in a straight line only. The distance between the centers of the crossheads is the same as that between the driving-pin centers; consequently the action and the angles with the resulting thrust are always alike on both wheels. This construction takes away the great disadvantage of the engine for high speeds. Incidentally, a better distribution of the wearing surface of the brasses of the crank-pin is obtained than is usual with the ordinary construction where the power for both wheels has been transmitted through a single pin. It is also anticipated by many that this device will overcome the pounding upon the rails and the flattening of the ties of the front drivers when such pounding and flattening are caused by the transmission of power to the rear wheel through an angle, while the downward throw of the side-rod is at the same time arrested. This blow, at a speed of 50 miles an hour, comes from 250 to 300 times per minute, and its intensity is very great. It would seem that it is to this action that the flattening of the drivers spoken of by Mr. Vogt, at the Altoona meeting of the American Engineers, may be traced. When this blow is arrested and the downward motion of the parallel rod stopped, the rod itself is exposed to a great strain through its own inertia.

The most noticeable, and perhaps the most radical, deviation from the ordinary type of American engine is found in the boiler itself. The limited space between the rails and the difficulty of obtaining a large fire-box has been one of the great drawbacks to the construction of a powerful engine to run at high speeds. The attempts that have been made to increase the sizes of boilers and fire-boxes have generally been attended with certain great and grave disadvantages; but these efforts have proved one thing most conclusively, namely, that when a powerful boiler can be made, an almost unlimited speed is attained with a very heavy train. Fig. 5 shows the general appearance of the boiler when in place upon the engine. Its remarkable feature is its great length. The trailing end, it will be noticed, is carried by a wheel about 48 inches in diameter. Figs. 6, 7 and 8 show longitudinal, horizontal and cross sections of the boiler. Fig. 8 gives the best idea of the construction. Commencing at the smoke-box end, we have a smoke-box of ordinary construction; then follow tubes placed in the usual manner, but 2¼ inches in diameter and some 10 feet long. So far the boiler differs in minor particulars from the ordinary form. The tubes, instead of opening into the fire-box, open into a large circular combustion chamber, formed of a corrugated tube 34 inches in diameter. This tube is corrugated, with a spiral groove. At its back end, at *b c* and *d e*, is a firebrick partition perforated with holes. Through this partition two large openings are made into the two fire-boxes. The fire-boxes themselves are formed of two circular arcs joined in the center by a single sheet and having a large corrugated flue and tubular grate. The combustion chamber is about nine feet in length and the fire-boxes are about the same. These fire-boxes contain the ash-pit, or what answers that purpose, and have openings through the straight portion of their length for the discharge of coal and ashes into the ash-pan below. The corrugated tubes obviate the necessity for crown-sheet stays, their own form furnishing a sufficient strength. The two are connected to the barrel of the boiler by offsets and straight plates in such a way as to obviate to a considerable extent any danger from unequal expansion. Whether there will be any is a difficult question to decide, but the fact that the corrugated tubes of flues expand and contract without producing any considerable amount of pressure on the tube sheets, would lead to the conclusion that little or no trouble would be found at the point of connection. With hard coal, 2-inch tubes 12 feet long will be used. The twin fire boxes have an important advantage over a single one, because one of them is always discharging hot gases into the combustion chamber above the temperature of ignition while the other is being fired.

The following are the principal dimensions of the boiler:

Internal diameter of barrel straight, inches	54
Length of fire-chambers, feet	9
Internal diameter of fire chambers and combustion chambers, inches	34
Material throughout	Steel
Number of tubes where 2¼-inch tubes are used	134
Number of tubes where 2-inch tubes are used	232
Length of tubes where 2¼-inch tubes are used, feet	10
Length of tubes where 2-inch tubes are used, feet	12
Heating surface where 2¼-inch tubes are used on fire and combustion chambers, feet	202
On tubes, feet	877
On grates, feet	103
Total square feet	1,182
Heating surface where 2-inch tubes are used on fire and combustion chambers, feet	202
On tubes, feet	1,392
On grates, feet	103
Total	1,697

Longitudinal seams of boiler to be double-welted, butted and double-riveted seams, while the circular seams are to be riveted with welted steel rings, the longitudinal seams made in such a way as to make perfect circles, and rings to be turned and accurately fitted.

Fig. 7 gives an idea of the location of the parts, being a section and view from the back end of the boiler. The feed-water is heated by a portion of the exhaust, in a heater arranged under the running board. This heater is constructed of a wrought-iron tube, 13 inches outside diameter, to the end of which is fixed a cast-iron head having two chambers divided by a diaphragm. Into this head are screwed 60 brass tubes, 1 inch outside diameter, 14 feet long, and having 210 feet heating surface. In each of these tubes is an inner tube, which is screwed into the diaphragm and reaches nearly to the end of the heating tube. The inner tubes are designed only for circulation. The exhaust from the two engines being connected, one to the chamber into which the heating tubes are screwed, and the other to the chamber into which the circulating tubes are screwed, admits of a constant backward and forward flow of the exhaust, caused by the alternate variation of pressure between the two sides by the quarter-beats of the engine. No exhaust is discharged or carried back to the exhaust pipes, while the condensation is carried away in a drip which is trapped.

The exhaust steam is taken from the exhaust pipes in the saddle by tapping in 2-inch nipples having half cup-shaped projections to catch a portion of the exhaust, while the main portion of it goes unobstructed to the blast nozzles. It is estimated that only about 12 per cent. of it is required to heat the water to 212° F. The water is fed into the heater at its front end, and passes through and out at the back, then passes through a short pipe to the check just forward of the cab. A pump is used to pump the water, while an injector is used as an auxiliary. One of these heaters, recently tested, showed an increase in evaporation of 1.09 pounds of water per pound of coal, representing a saving of 22 per cent. on an ordinary locomotive over feeding cold water.

The running gear is so arranged that the weight of the boiler is distributed over 10 wheels—*i. e.*, the drivers, the leading truck and a two wheeled truck trailing behind the drivers, with the equalizing bars so arranged as to distribute the weight equally over the drivers and trailing wheels, while the trailing wheels are arranged to work on the Bissell principle, and the rigid wheel base is no longer than an ordinary locomotive. The position of the drivers, being forward of the wide portion of the fire-chamber casing, admits of lowering the center line of the boiler, or down to that of any ordinary locomotive having a 54-inch shell in the barrel. This engine and boiler have been designed to handle the heaviest express trains, like those between New York and Philadelphia, at the highest rates of speed. Most of the engines in use are manifestly unequal to this work, even when the question of economy is left out of consideration entirely. None of the great Trunk lines are now able to make fast time with a heavy train of parlor cars. The new engine has the essential features needed in an engine capable of hauling a heavy train at high speed, the work for which it was intended by the inventor.

Car Builder's Club—Discussion on Wheels.

The January meeting was held at the rooms, 113 Liberty street, on Thursday evening, 18th ultimo, the subjects for discussion being, Car Wheels, and Gauges for Seating Wheels on Axles; also Rail Sections and Track Gauges.

Mr. Blackall wanted to know the cause of so much chill-cracking in the plates of wheels.

Mr. Marden made a similar inquiry. He had wheels in his yard which the inspector had refused to receive on account of cracks in the plates. They were new wheels, and had not been in service more than a month.

Mr. Swett said, what wheelmakers understood by a chill-crack, was a crack in the chilled tread. A crack in the plate was another matter, and might be caused by poor iron, bad cooling, or a form of wheel not adapted to the contraction or expansion resulting from the heating of the tread. Some wheels would crack in the brackets before they were put under cars, and yet be made of good iron.

Mr. Marden wanted to know whether it was safe to run wheels that had from 3 to 7 brackets cracked.

Mr. Swett had made two differently formed wheels, both being cast from the same ladle of iron and cooled in precisely the same way. One of them was found the next morning broken across the tread from one side to the other, while the other was broken only with 36 blows of the sledge. He should consider any wheel unsafe that was cracked in the bracket.

Mr. Creamer thought the remarks of gentlemen militated strongly against iron wheels, and that the question was whether the time had not come to make a change.

Mr. Swett said he had made about 40,000 iron wheels of his pattern, and, so far as he knew, not more than two of them had been broken in four years. If any steel wheel could show such a record he would like to see it.

Mr. Baker considered it unsafe to use a wheel that was cracked or defective in any way.

Mr. L. Garey would not knowingly permit a wheel that was cracked in the plate or ribs to run under freight unless it was to deliver at destination; and in the case of a passenger car, it should not run at all after the defect was discovered.

Mr. Swett said that cracks in brackets showed there was a strain on the center of the wheel from the rim. The wheel had not properly cooled, and in cooling the hub had shrunk after the tread had taken form. Cast iron would not stretch a great deal, and something must give way in pulling around curves. A wheel with such a strain on it is liable to break when it gets a sudden blow, or if the tread is heated in sliding down grades the wheel is liable to be pulled in two. Wheels with checked brackets were not necessarily dangerous, but they were not so safe under strain.

Mr. C. E. Garey said with reference to wheels of different sizes on the same axle, and different distances from the journal, that he had made some experiments for the purpose of determining the wear of such wheels. Of 247 pairs removed 144 were worn alike on the treads, 95 pairs had a sharp flange on one wheel, and of these, 39 pairs had one wheel worn in the usual way, while the opposite wheels had sharp flanges; 59 were the longest distance from the inside collar of axle to flange of wheel, 16 were the shortest distance, and 20 were of equal distance. The results showed that an axle might be a little short or a little over $\frac{1}{16}$ of an inch in length, and there might be a variation of $\frac{1}{32}$ of an inch in pressing on wheels, without necessarily making any difference in the wear of axles on wheels. Of 243 axles, 108 varied less than $\frac{1}{32}$ in standard length, 28 were short from $\frac{1}{32}$ to $\frac{1}{16}$, and 107 were long from $\frac{1}{32}$ to $\frac{1}{16}$, making a variation of $\frac{1}{8}$ of an inch from standard length. There was also a variation of from $\frac{1}{32}$ to $\frac{1}{16}$ in length of journals, and from $\frac{1}{32}$ to $\frac{1}{16}$ in journals of the same axle.

Mr. L. Garey said that the limit of variation in length of axle and seating of wheels ought not to exceed $\frac{1}{8}$ of an inch, but practically it was from $\frac{1}{4}$ to $\frac{3}{4}$ of an inch, and possibly more. He thought that in the matter of wheels that were not round, a limit of variation should be fixed at which railroad companies should receive such wheels from the makers.

Mr. Baker did not believe it possible to make a chilled wheel perfectly round. In his foundry the chills were tested with a gauge every day, and if any were found out of round they were condemned. He had tried all sorts of plans to keep chills round, but could not keep them so when they once began to get wrong. He had tested them by balancing, and it would probably be found that steel-tired wheels were more out of balance than chilled wheels; he had found some that were 28 pounds out of balance.

Mr. L. Garey did not know of any satisfactory mode of testing the strength of wheels except by actual service. Axles could be tested before being put under cars, but not wheels.

Mr. Adams thought a great deal depended on the form or pattern of wheels in respect to the strain to which they were subjected. He would not condemn a wheel with a $\frac{1}{32}$ of an inch chill-crack in the tread, but if the cracks were large enough to crumble, the wheel was not fit to run. If there was a crack in the plate he should condemn the wheel at once, but one or two cracks in the brackets he would not consider dangerous. He believed in steel wheels. There was not a perfectly round cast-iron wheel in existence, if the chill was depended on to make it round. They varied from $\frac{1}{16}$ to $\frac{1}{16}$ of an an inch. He did not propose to go and examine all the wheels on his road to see if they were round, or test them with the sledge. In regard to the wearing of flanges, the wheelmakers were not at fault. The wear was caused by the hard resting of the car body on the side-bearings in curving, which prevented the trucks from following the curve easily.

Mr. Baker said with respect to the grinding of chilled wheels, that a wheel properly made would run more miles without grinding than with. But it should be *properly made*, and this cannot be done at any foundry at the present ruling prices of wheels, because the prices would not cover the cost of manufacture. Defective wheels should be condemned in the foundry and not outside. Nothing should be guessed at. At his foundry three sizes of wheels were allowed, and they varied $\frac{1}{32}$ of an inch in circumference. He varied by twentieths of an inch. If two wheels that have the same tram mark are put on an axle he would guarantee that they would have absolutely the same circumference. He had tried thick and thin chills, and had found there was a happy medium at which the wheel would stand better than at any other thickness. He made his chills out of wheel iron. The average life of chills, where they were constantly used, was not over a year.

Mr. Marden had of late found a good many wheels flattened by sliding, and had found the flat places almost invariably on the smaller circumference of the wheels that were out of round, which showed that the brake catches the wheel and holds it. He had yet to find a steel wheel under his passenger cars flattened by sliding. One of the several causes of sharp flanges was the trucks being out of square. If it was safe to run a wheel with from two to five cracked brackets, the brackets might as well be left out.

Mr. L. Garey called attention to the forms of rail sections and wheel-flanges and also the placing of guard-rails. In regard to the latter, track men did not seem to be governed by any standard. The old plan was to have a clearance of 2 inches at the point of the frog in the frog and 2 or 2¼ inches between the guard-rail and the main rail, but most roads had reduced the distance to 1⅞ inch. If, in seating the wheels on the axle, ¼ or ⅜ inch lateral play is allowed and the flanges are 1¼ inch thick it would leave 4 ft. 5¼ in. between the flanges, and if the space between guard-rails and main rail is 1⅜ in. the distance over all would be 4 ft. 5 in. If, under these conditions, the guard-rails are set on curves, as they sometimes are, without reference to the spread of the track and exceed that distance in order to let the wheel go through, the result would be either a loose wheel, a loose guard-rail or a bent axle. Something must give way.

Mr. Adams said that on the Boston & Albany, if the bases of the rails were put together so as to touch, the heads of the rails would be 2 inches apart.

Mr. Lentz said the wheels of the Pennsylvania railroad cars fit very closely on the Lehigh Valley track, which was 4-8½ gauge, and that the wheels removed on his road from cars of the Pennsylvania road on account of thin flanges were about 40 per cent. of the whole number, while the Lehigh Valley car wheels removed from same cause were only 4 per cent., which he attributed to the fact that the corner of the rail top on that road fitted the curve of the wheel flange. He allowed ⅜ inch lateral motion.

Mr. L. Garey asked if any one had discovered any difference in the power required to move a train with a tight gauge, like the Pennsylvania, allowing only ¼ inch play, and the ordinary ⅜ or ½ inch play between flange and rail.

Mr. Lentz had never discovered any difference, although a great many Pennsylvania cars moved over his road.

Mr. Marden said he had been told a number of times by locomotive engineers that whenever there were a number of Pennsylvania cars together in a train, the train was invariably much harder to haul.

Mr. L. Garey had heard it said that one engine that could haul 40 cars gauged for a 4-8½ track could haul only 30 on same track with wheels gauged for a 4-9 track, and he was inclined to think there was just about that difference in hauling Pennsylvania cars over a 4-8½ track, and cars gauged for ⅛ or ¼ inches lateral play.

THE shops of the Lake Shore & Michigan Southern road, at Cleveland, have about four engines constantly in hand for repairs. No new engines or cars are being built. The road is using with much success a new arrangement for cooling hot tender-truck boxes. It consists of a rubber tube connected with each box, and supplied with water from the tender, the tubes being connected with a cock within reach of the engineer. The method is used only on fast passenger trains. Channel-bar tender frames are extensively used on the road, although they are objected to on many roads in consequence of the present prices of oak. They are certainly expensive things to repair after being in a wreck. These shops, although old and lacking many modern conveniences, turn out a large quantity of work. Mr. Withycombe, the master car-builder, is a veteran in his occupation. He built the first passenger car in Ohio some 35 years ago, from plans designed by the late W. F. Smith, then the master mechanic of the Cleveland & Columbus road. These men, with I. H. Congdon, now general master mechanic of the Union Pacific, were from the east, and were the pioneers in the mechanical departments of the first successful railroad in Ohio. The energy displayed by them in overcoming obstacles incident to a new country in which skilled mechanics and shop facilities were quite unknown, was a creditable feature of early railroading. A few of the cars built by Mr. Withycombe 30 years ago are still in service, and the fact that they "stand up" better than many of modern construction, he thinks is largely due to the old practice of siding them up lengthwise, and using plenty of glue. The shops at Cleveland have been building about 15 gondola coal cars a month, but are now engaged mostly in repairs. The Buffalo shops of the road have seven engines undergoing general repairs. The standard cylinders of the engines of this road are cast separately from the saddle. This method, although much used years ago, and subsequently abandoned to a great extent, is coming rapidly into favor again. The general foreman, Mr. Follers, uses the method described in the October CAR-BUILDER for heating water in boilers that are to be tested by hydraulic pressure. These shops are at present exclusively occupied with repair work.

A CORRESPONDENT of *Blacksmith and Wheelwright* gives the following recipe for tempering locomotive springs: "Eight ounces gum Arabic, four ounces oxalic acid, two pounds fine salt, two and one-half pounds brown sugar and fifteen gallons whale oil. Heat the leaves of the spring red hot, but not so as to burn or overheat. Plunge into the mixture and let lie until cool. In using the mixture it will have to be employed in an iron tank." This, he says, has been tested and is now in use in a number of railroad shops.

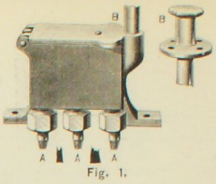


Fig. 1.

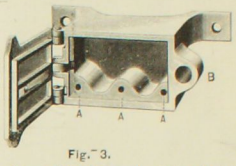


Fig. 3.

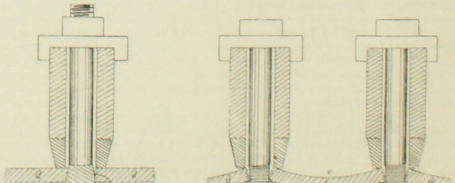
Fig. 2.

Campbell's Automatic Oiler for Locomotives.

This invention is designed for lubricating regularly and automatically certain parts of locomotive engines which are inaccessible when the engine is in motion, such as the shoes, wedges and boxes of the driving axles.

The box or reservoir for holding oil and wick is fastened to the frame of the engine as near as possible to stirrup. Three pieces of gas-pipe, **A A A** Fig. 1, are fastened to the bottom of the box by means of brass pipe-nuts, which are so bent as to reach the box or journal-bearing and the tops of the shoe and wedge on each side of the box. On the inside of the oil box, and corresponding to the projections to which the pipes mentioned are attached, are tubes, **A A A** Fig. 3, cast with the box, and into these wick is inserted for feeding a regular quantity of oil—the quantity being determined by the amount of twist given the wick. Easy access is had to the box by means of a spring lid, **B** Fig. 1. At one end of the box is a projection into which is inserted the supply-pipe that runs from the cab or foot-board. A plain, strong oil cup, **B** Figs. 2 and 4, for the cab or foot-board is furnished that cannot be broken or dented, as is the case with the sheet-brass cups so generally used; into this cup oil is poured, when running, if necessary. Four or six boxes are used, depending on the number of drivers. Each cup will supply oil sufficient for a run of from 400 to 600 miles, as there is no waste. For prices or other information, address L. B. Flanders Machine Works, Philadelphia, Pa.

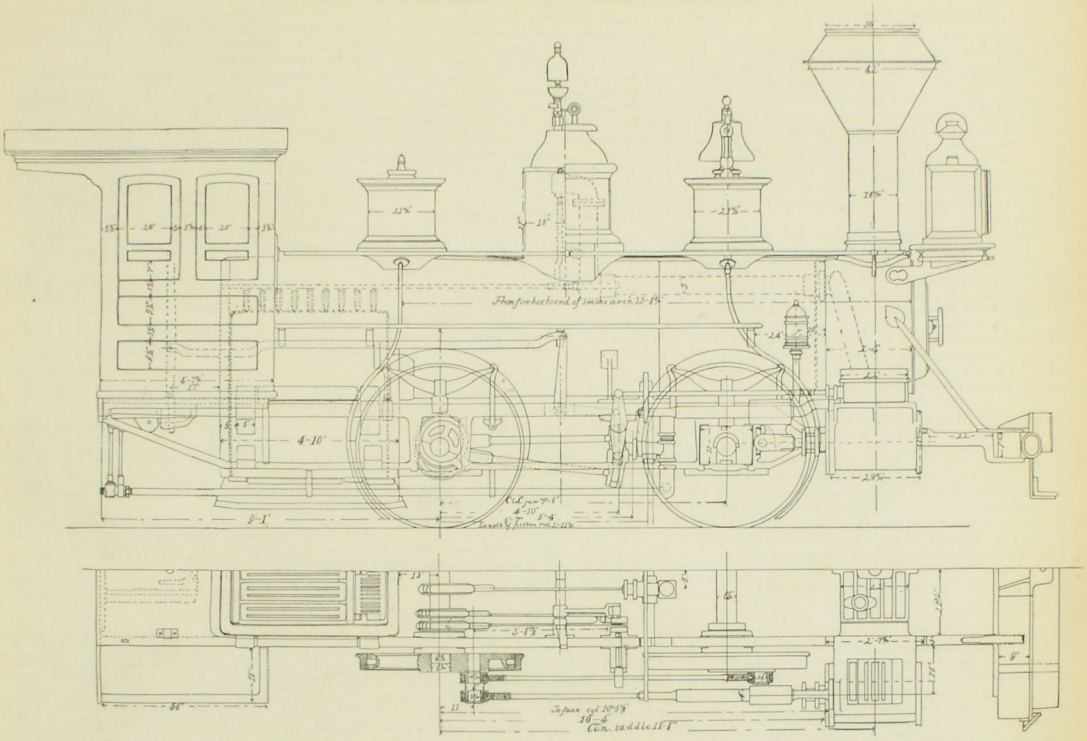
A NEW locomotive fire-box door has recently been designed by Mr. Butman, of the Butman Furnace Co., of Cleveland, O. The door is hung so as to open upward. A fireman in firing an engine usually stands with one foot on the gangway and the other on the footboard, in which position he can fill his coal scoop with very little motion of his body. With the ordinary door, he must unlatch, open and close the door for each shovel of coal, and to do this he must release his hold on the shovel to grasp the chain which lifts the latch. In Mr. Butman's door, there is a short piece which projects through the footboard at the place where the fireman's foot is placed. When he wants to open the door, he presses on this projection with his foot, and this, by means of a lever beneath the footboard, unlatches and opens the door. It can also be closed by a side-pressure of his foot, and is then securely locked by a latch. It is simple in its construction, being composed of about five pieces, and is to be used on the engines of the Lake Shore and C. C. C. & I. roads in Cleveland. We are promised a drawing of it for insertion in a future issue.



Crown-Sheet Stay-Bolt Construction.

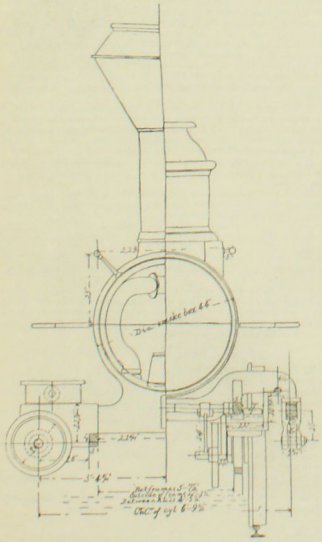
The cuts illustrate a faulty construction of crown sheet stay-bolts, to which our attention has been called by Mr. F. D. Casanave, the General Master Mechanic of the Pittsburg, Fort Wayne & Chicago road. The defective method is shown in Fig. 2, in which the crown sheet *d* had been overheated, and bagged as shown at *c*. The stay bolts were screwed in and riveted over as at *e*, and the overheating caused an enlargement of the bolt holes, which unlocked the thread at the top side, leaving the sheet to be supported only by the lower thread and rivet, which gave way in the case of one engine which came in for repairs, the rivet assuming the form indicated by the dotted lines at *b*. Mr. Casanave's present practice is to turn a taper on that portion of the bolt in contact with the sheet, as shown at *a* Fig. 1. The bolt is driven from the bottom and held by a nut at the top, as shown. In driving this bolt, it is claimed that a portion of the surface of the taper is stripped, which makes a perfectly tight joint in the sheet. The groove in the head is to provide room for the stripped portion to back up into. This construction, it is evident, will sustain the crown sheet under all circumstances.

SWITCHING LOCOMOTIVE—CHICAGO & NORTHWESTERN RAILWAY.



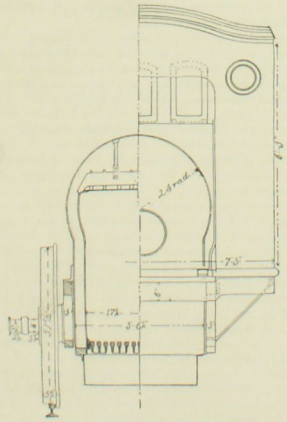
Side Elevation and Plan.

From center to center of jaws, 7 ft. 8 in.; from center of main axle to center of rocker-arm, 4 ft. 10 in.; from center of main axle to face of pump, 5 ft. 4 in.; from center of main axle to front face of guide yoke, 5 ft. 7 in.; from back end of frame to center of main axle, 9 ft. 1 in.; from center of main axle to face of cylinder, 10 ft. 5⅛ in.; from center of main axle to back cylinder head, 10 ft. 4 in.; from center of main axle to center of saddle, 11 ft. 8 in.



Half Front Section and Elevation.

Between frames, 3 ft. 7⅛ in.; outside of frames, 4 ft. 1⅝ in.; between hubs, 4 ft. 5⅞ in.; center to center of cylinders, 6 ft. 9⅛ in.



Half Back Section and Elevation.

Throw of eccentrics, 4¼ in.; radius of link, 4—5⅛ in.; length of main rod, 7 ft. 8½ in.; No. of flues, 113; length of flues, 11 ft. 6 in.

THE Rhode Island Locomotive Works are building 5 ten-wheel engines with 19x26 cylinders, for the New York, New Haven & Hartford road; 15 eight-wheel for the Canadian Pacific; 5 for the Missouri Pacific, and 20 more for various roads. The orders in hand are sufficient for four months' work.

THE New York Locomotive Works, at Rome, N. Y., are turning out six engines per month. The orders in hand are for 5 eight-wheel engines, 17 × 24 cylinders and 5-ft. drivers, for the Northern Pacific; 3 mogul switching engines, 16 × 24 cylinders and 42-in. drivers, 17 moguls, 19 × 24 cylinders and 48-in. drivers, and 4 eight-wheel, 17 × 24 cylinders and 5-ft. drivers, for the East Tennessee & Virginia road. They are also building 4 narrow-gauge engines, 15 × 20 cylinders and 48-in. drivers. The engines resemble in appearance the Rhode Island build. Interchangeable templets are used, so that repair work can be ordered ready fitted to put in place. The present force is about 300 men, which is likely to be increased to enable the works to fill prospective orders.

THE Jones Car Manufacturing Co., of Schenectady, employ 425 men, and are full of work. This company are the successors of J. M. Jones & Co., the well-known manufacturers of street cars, and commenced the building of steam road cars about a year ago. They have just completed four Wagner sleepers, 66 feet 6 inches long by 9 feet 6 inches wide, with six-wheel trucks and 42-in. wheels. One of the cars has Allen paper wheels, two of them Paige's wrought metal and one Washburn steel-tired wheels. The cars are named respectively, "Washington," "Jefferson," "Lincoln," and "Garfield," and are to be run in the new fast trains between New York and Chicago. The interior finish is in mahogany, and in beauty of design and artistic decoration, inside and out, they are not surpassed by any cars of their class in the country. Three more sleepers are in process of construction, to be named "Levrer," "Chicago," and "Genoa." The "Chicago" is 63 ft. long, and the other two 54 ft., and are to run on six-wheel trucks with cast iron wheels. The company is also building three Paige sleepers, 57 ft. long, the weight of which will be 27 tons each, or about 10 tons less than other sleeping cars of the same size. These are also finished in mahogany, and in the ornamental details are unrivaled in beauty and elegance. They are to have four-wheel trucks with Paige's wheels. In addition to the above, ten standard day coaches are also in progress for the Chicago and Northwestern road, the engraved drawings of which will be found in the January CAR-BUILDER. They will weigh about 26 tons each. These cars have been inspected by Mr. Boon, the superintendent of motive power of the road, who is highy pleased with every feature of their construction. Fifteen coaches are also under way for the New York Central, dimensions 55 by 9½ feet, with four (42-in.) wheel trucks, weight 26 tons, mahogany finish. In the street car department some 60 cars are in course of construction. Last year about 500 cars of this class were built at the works, and in the winter and spring about 150 excursion cars are built in advance of orders, so as to meet the anticipated demand. The wood work used in construction is air-seasoned timber exclusively, of which the company has on hand a sufficient supply to last a year and a half.

A RENO Indian begged a pair of pants in which some hornets had built a nest, and when the insects warmed to business the Indian cut a hole in the atmosphere that hasn't entirely filled up yet.

Communications.

"Unexplained Derailments."

To the Editor of the National Car-Builder:

In seeking for the causes of railway accidents in this age of mechanical perfection, the seeker is very apt to overlook careless workmanship. This is very natural in view of the fact that our shops are manned with skilled workmen, and provided with tools and machinery for doing work with the greatest precision and accuracy, especially in the fitting of the various parts of cars and locomotives. Yet it is true, nevertheless, that bad workmanship is often the primary or direct cause of a large number of the accidents which happen on railways, to say nothing of the undue wear of both track and rolling stock and consumption of expensive material.

The class of accidents that are preventable to a greater or less extent by more careful workmanship, are such as come under the head of "unexplained derailments," and in view of the good condition of the tracks of most of our roads, these accidents are of very frequent occurrence. With good tracks and well built rolling stock, it would seem impossible for a car to leave the track unless there is some obstruction in the way. Years ago, when our roads were in a wretched condition compared with their completeness now, a derailment under circumstances where no actual breakage appeared, was in most cases attributed to bad track. But as the tracks are now, these mishaps are enveloped in mystery to a great extent. The more the causes are investigated, however, the more apparent they become. It is discovered that some car wheels are pressed on the axles further than others, and although they may be of the prescribed gauge, it brings the truck frame diagonally across the track, which has a tendency to crowd the wheels over the rail, especially if the flanges are worn. It is found in a majority of cases where the flanges are worn, that the wear is confined to but one wheel on the axle, and that such wheels are diagonal in their relative positions. Wheels of different diameters are also put on the same axle. This must, of course, cause slipping, and under heavy loads, a severe torsion of the axle, and a liability of the wheels to leave the rails, especially when the larger wheel is on the short side of a curve. It is also being discovered that the bore of the hub of many wheels is not concentric with the rim, which causes pounding of the rails, oscillation of cars and vibration of bridges. The wheels also slip under the action of the brakes, and flat spots are produced on the treads.

Thus one defect begets another, a result which can only be avoided by greater accuracy and precision in every detail of construction. The time and trouble necessary to remedy a slight deviation from mechanical exactness may avert a serious disaster. A single truck, if not properly constructed, may put a whole train in the ditch, and add another to the record of "unexplained derailments," a term which is about as comprehensive as "malaria" in the medical vocabulary—a harbor of refuge for lack of ability to make a correct diagnosis of the case.

WM. S. HUNTINGTON.

Varnishing Passenger Car Bodies.

To the Editor of the National Car-Builder:

The December issue of your valuable paper contains an article on this subject from Mr. A. P. Sweet, of the Detroit, Lansing & Northern road, in which he favors what is called the "repeating" process, or the application of the finishing coats of varnish at intervals of from 24 to 48 hours between each. He says that he knows of but one car shop where this process has been systematically adopted, and that in his own shop he usually applies the last coat of wearing varnish on the third day after applying the first, which is not strictly the repeating process, but a near approach to it. He does not say whether rubbing or wearing varnish, or both, should be used; but I infer that wearing body varnish is meant.

Now, with all deference to the views of Mr. Sweet and of others who concur with him, it appears to me that there must be something defective in a system which requires the application of two or three coats of wearing body varnish at intervals of from 24 to 36 hours between the coats, and for the following reasons:

Wearing body varnishes contain, as a rule, double the quantity of oil that rubbing varnishes do.

The drying qualities of any varnish depend on the quantity of oil contained in the undercoats, and also on the quantity of oxidizing material contained in the same. In using varnishes of different makers, we find a great difference as to the time required for drying, and we also know that the most, if not all, wearing body varnishes do not dry in the given time named.

When varnish dries thoroughly, that is, after all turpentine has evaporated and the oxidation of the oil contained in it is complete, it has then formed what is called a resinous body, which, if observed under the microscope, will exhibit a crystallization containing numerous pores.

If these crystals are not thoroughly hardened, the putting on of a coat of varnish with brush will crush them, and consequently the pores will be closed, thus forming air globules underneath and shutting out the liquid varnish of the second application.

When varnish sets it has only given off its turpentine by evaporation, and after that the oxidation of the oil contained in it commences. Now, if this is interrupted by another coat of varnish, the oil of the first coat has no chance to dry, and will stay soft beneath the upper coat, as the oil has not thrown off all its carbon.

A great deal is said as to cause and effect, but I think the foregoing sufficient to illustrate my meaning, which is, that by the repeating process you must evidently have a soft foundation and hard outside surface. The oil contained in the first coat of varnish cannot completely oxidize on account of being shut in by the succeeding coat or coats, and that the last coat of varnish of itself must dry by reason of the air coming in contact with its surface, thus giving a soft foundation with a comparative hard finish, which no doubt, when acted upon by heat and cold, would cause premature decay, cracks, etc., like the surface of a mud-puddle in summer when acted upon by the sun and air.

Again, I do not think that the premature decay of varnishes is due so much to the way they are applied to car bodies, as to the quantities and way in which the different ingredients that the painter uses to make up a foundation to receive the varnish, are prepared and thrown together. A very elastic varnish may do well on a foundation prepared in a given way, while one having less elasticity would certainly crack and perish prematurely. I might here say that as a rule varnishes of different makers do not contain the same proportions of oils, gum, driers, etc., or in other words, have not got the same elasticity, yet if properly treated, a good varnish should always give good results no matter who the maker may be.

The theory advanced by Mr. Sweet, that three coats of varnish given in quick succession, no matter what time is allowed between coats, will assimilate and become one continuous body, I do not think is correct. Every painter who has washed and revarnished cars, knows that the top coat of varnish is often entirely removed from panels leaving the under coats good and intact.

I heartily agree with Mr. Sweet that more time should be allowed before putting newly painted cars into service, in order to give the painted surfaces that degree of hardness that is necessary to make them wash and wear well. In this matter both painter and varnish are sometimes blamed undeservingly. M. C. P., Brantford, Ont.

Automatic Couplings and Draw-Bars.

To the Editor of the National Car-Builder:

The report of the committee of the Car-Builders' Association on "Automatic Draw-bars," as published in your December issue, is in my judgment very lame and incomplete in its statements, and far from satisfactory in its conclusions.

An automatic draw-bar is understood to be a self-acting device for coupling and uncoupling cars without requiring any action on the part of the train men, and I have no hesitation in saying that such a device is as difficult to produce as a piece of mechanism that will successfully overcome the obstacles to perpetual motion.

Scarcely any of the devices named in the report of the committee claim to be automatic in their action, and the very few for which such a claim is made, are so complicated in their construction and entail such a heavy expense upon the railroad companies which adopt them, that it is extremely doubtful whether any of them will ever come into general use. Among those which the committee say "are not practicable or applicable to freight cars," is "Cuddy's," or the Haulenbeek coupler, for which I am agent. Without intending to cast any reflections on the gentlemen whose names are appended to the report, I desire to say, that it has never been claimed that the Haulenbeek coupler is automatic in its action, and it should furthermore be said that it has never been practically tested by the committee. It has, nevertheless, been found to be applicable to freight cars wherever it has been practically applied to them on the roads. It is claimed in its behalf, that it is simple in construction because there is so little of it, and hence it is not liable to get out of order; it is cheap, because it does not require any change in the present style of draw-heads; and effective, because it can be operated from either side or from the top of a car with one hand, and will couple any car of ordinary construction with another.

Believing that the committee have unintentionally done great injustice to this device, I would respectfully ask the members of the association to carefully inspect a full sized working sample of it which will be shown at the national exposition in Chicago, next June.

I do not wish to be understood as disparaging other devices of this class that may be offered to railroads with a view to the protection of train men from injury. There are doubtless many others that are "worthy of mention," besides those named by the committee, all of which should be treated fairly and justly, and without partiality.

ST. LOUIS, MO., Jan., 1883. WM. S. CUDDY.

THE COWELL PLATFORM, a device for making the platforms of passenger cars continuous, is highly recommended by many railway men. It makes the cars run steadier, prevents jerking and jolting, and enables persons to pass from car to car when trains are in motion, with comparative safety. It has lately been adopted by the Flint & Pere Marquette road, and will be applied to all its passenger cars.

Instructions for Working the Westinghouse Air-Brakes.

The Superintendent of Air-Break Equipment on the New York Central & Hudson River Railroad, Mr. A. H. Catlin, has issued the following "instructions for the use and care of the automatic air-brake:"

The attention of air-brake inspectors and engineers is called to the following rules:

1. In making up trains, all the couplings must be united so that the brakes will apply throughout the entire train. The cocks in the brake pipe must all be opened (handles pointing down), except that on the rear of the last car, which must be horizontal, and the hose on the rear end of last car hooked up.

2. In detaching engines or cars the couplings must invariably be parted by hand, when practicable to do so; the cocks in the brake pipes must always be closed before separating the couplings, to prevent application of the brakes. At stations where it may be necessary to cut the train to take or leave cars, trainmen must not turn the stop-cocks or disconnect the hose until the brake has been released by engineer.

3. If the brakes are applied when the engine is not attached to the train or cars, they can be released by opening the cock in the end of the small cylinder or the one under the auxiliary reservoir.

4. The adjustment of the brakes should be such that, when applied, the pistons in the brake cylinders will not travel to exceed eight or nine inches. This will allow room for wear of shoes, stretching of rods, springing of brake beams, etc., while on the road.

5. Great care must be exercised, in taking up the slack in connections, to have the levers and pistons pushed back to their proper places, and the slack taken up by the under connections or dead lever.

6. The brake cylinders and triple-valve must always be kept clean and free from gum, so that they will readily release when the air has been discharged, and oiled once a month; mark the last date of oiling on the cylinder with chalk.

7. For the automatic brake, the handle of the four-way cock must be turned horizontally. If turned down will change it to the simple air-brake; if turned midway between these two positions it will close communication with the brake cylinder and reservoir, and should be turned when desirable to have the brakes out of use on any particular car, from breaking of rods, etc.

8. In starting the pump, engineers must allow the condensed steam time to escape gradually, and not endeavor to force it out by undue pressure of steam.

9. Engineers will regulate the quantity of air to be applied to the brakes by the speed of the train, and must not use the full pressure except in cases of emergency; they must apply the pressure gradually to avoid the discomfort to the passengers or damage to the apparatus. The brakes should be thrown off just as the train is coming to rest.

10. Engineers must know, before leaving the round-house, that their engine-valve and pump are in perfect working order, and must report promptly any defect, that it may be repaired at once.

Inspection.

11. After engine is coupled to train, and all connections are made, the engineer will charge the auxiliary reservoirs under the cars by pushing the handle of valve to the extreme left. After train is charged he will bring the handle to the right, just over the running notch, but not far enough to allow the air to escape from the train line; leaving it in this position for a few moments, and noting any leakage, which will be indicated by a gradual falling off in pressure, as shown by the air gauge. After this apply brakes gradually and allow them to remain on long enough for inspector to see that they apply throughout the entire train. Seventy (70) pounds is the maximum pressure allowed on train line and auxiliary reservoirs, and must never be exceeded. Better braking can be done with less pressure when rails are slippery.

12. The inspector must take his position at the engine while train is being tested, that the engineer may inform him if any leak be discovered, which must be promptly attended to. He will then examine each car throughout the entire train to see that the brakes have applied properly, and if all is right, will signal the engineer, who will release them.

13. In damp weather the triple valve should be drained daily, to let out any water that may have collected. Slack the bottom nut about half a turn, let the water escape, and screw it up again.

14. The valve for the application of the brakes from the inside of the car should be kept tight, and must be examined always by the inspectors when the car is standing at terminal stations.

15. When brakes do not release readily on one or two cars, but promptly on balance of train, an unequal pressure is evident; in such cases "bleed" the auxiliary reservoirs of the cars with over-pressure until brakes commence to release, thereby saving time of equalizing by pumping from engine.

16. No excuse will be received for trains leaving stations where inspectors are employed, without the air brakes being in perfect order.

17. When trains start from points at which no car inspectors are located, the conductor of the train must see that the test is made in accordance with these rules.

Lubricants to be Used.

18. For lubricating steam pump and reversing heads, use valve oil.

19. For air pumps and brake cylinders, use the best earth oil.

20. Engineers must keep a supply of above on hand for use as required.

21. The oil cups on reversing cylinders and steam supply pipes feed automatically, and, if properly adjusted, will require filling but once for a run of five (5) hours. Care must be taken before filling the cup to let out the condensed steam by opening the small cock at the bottom of the cup.

Supplies to be Kept on Hand.

22. Engineers must always have on hand an extra coupling.

23. Inspectors at all points must keep on hand, ready for immediate use, a supply of all parts that are liable to get out of repair, as well as tools necessary for making repairs.

In carrying out Rule 12, the inspector *must* take his position *on the engine*, where he can see the air gauge.

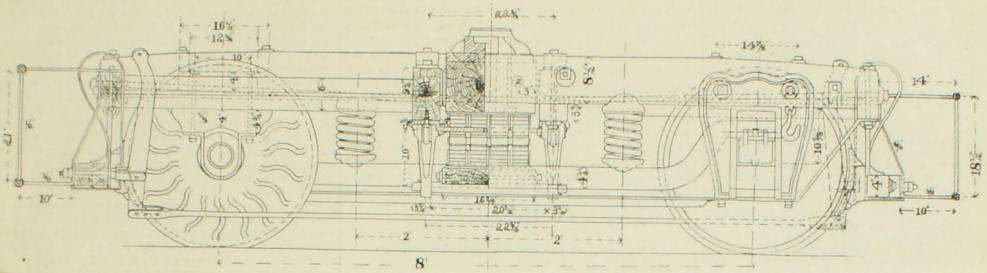
When any defect is found in the brake on a car which would cause too much detention to train to repair, and necessitates cutting out the brake on that car, information of it must be telegraphed me at once.

Inspectors must also notify the conductor and engineer running the train of such defect.

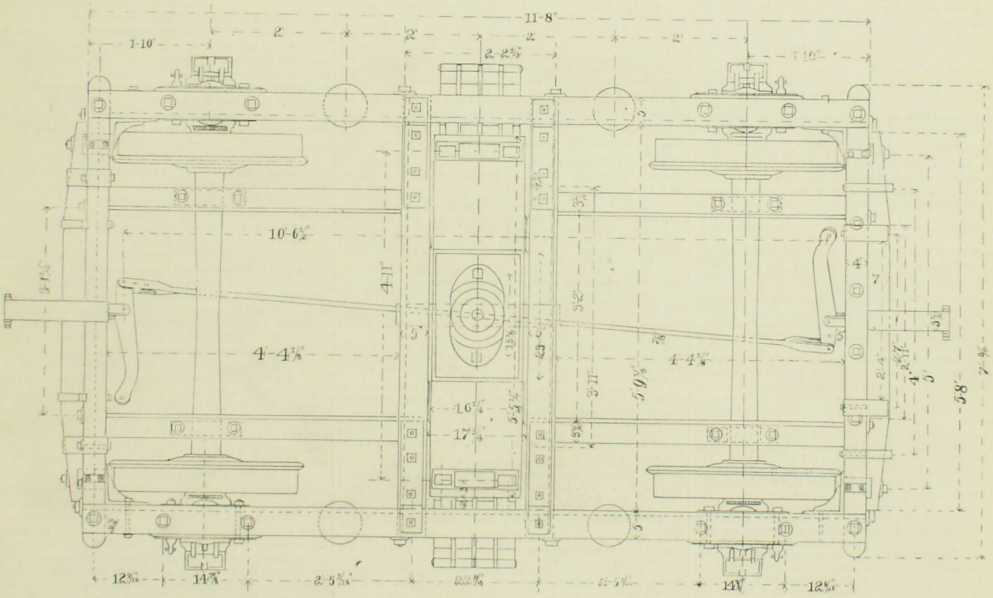
Engineers will report promptly any neglect to make the inspection in strict compliance with the above rules.

THE Superintendent of the Genesee Valley road has issued the following: "Notice to passenger conductors: Spittoons will be placed in the ladies' cars on the Rochester Division, and your brakemen, in case they find any one spitting on the floor, are to move a spittoon to them and politely ask them to use it. Two boxes of blacking and a blacking brush have also been furnished each passenger car, and we expect every man on passenger trains to use them. Please say to your crew that the maintaining of a neat appearance on duty will be considered an important factor in selecting men for promotion."

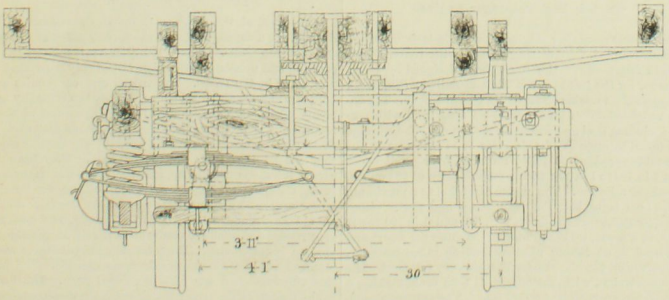
STANDARD FOUR-WHEEL PASSENGER CAR TRUCK—CHICAGO & NORTHWESTERN RAILWAY.



Side View and Longitudinal Section.



Plan.



End View and Section through Bolster.

THE London *Railway News* calls the attention of English railway companies to the Chicago exhibition, and hopes they will not be backward in sending exhibits to compete with those of American design and construction. It expresses the opinion that much advantage will result to the manufacturers of both countries from a friendly and candid examination of the different systems and methods for securing the most suitable and economical appliances in railway operation.

THE new building of the Young Men's Christian Association (Railroad Branch), at Troy, N. Y., was opened for inspection on the evening of Dec. 21, and was greatly admired. It is the largest and most elaborate of its kind in the country, costing $10,000. It is expected that it will be dedicated next week, free of debt. The first subscription of $500 was received a year ago from W. H. Vanderbilt. Cornelius Vanderbilt and other prominent men were expected at the formal opening last night.

Locomotives and Higher Speed.

We copy the following from an article on "Locomotives of 1882," by William Barnet Le Van, in *American Machinist*:

Within the last few years higher speeds have been called for, which means increased consumption of fuel, unless some radical change is made in the valve arrangement of our locomotives. To accomplish this we must also increase our initial steam pressure in the cylinder, and maintain it without expansion up to the point of cut off, and reduce the back pressure.

What the traveling community want is greater speed, as long as it can be had with safety. The time is not far distant when passenger trains will be required to run at sixty miles an hour as soon as our roads are in a condition fit for such speeds, as they eventually must be. To maintain such speeds with trains of four or five cars, even over a nearly perfect road, we must reduce the increasing weight, particularly the dead weight.

It is notorious that the greatest part of the work done by locomotives upon railroads is applied to hauling dead or nonpaying weight, and this defect in railroading is not mended by drawing a couple of passenger cars with a locomotive weighing thirty tons, nor by putting two passenger locomotives on a freight train.

To accomplish high speeds with our locomotives, we must increase the evaporative power of our boilers, in which we are limited by the width of our track; therefore, it behooves us to increase our boiler and initial steam pressure in the cylinder, and reduce the back pressure due to contracting of the exhaust nozzles. Independent cut-off valves will also be required. Independent cut-off valves are not new in locomotives, having been used many years back (1849-'50) with great success both in this and other countries, and were found to be very efficient. Unfortunately, in this country these improvements were in advance of their time, on account of their additional ex-

pense and the small amount of capital then at the command of the railroad companies, but the time is not far distant when a first-class locomotive without an independent cut-off will be the exception and not the rule.

Railroad superintendents have been looking towards wrong sources for improvements; they shut their eyes to the teachings of the stationary steam engine builders in their improved practice, dismiss mechanical engineering talent, and wait for patentees and speculators, hoping, like Micawber, that "something will turn up." They look for some wonderful discovery to relieve them from the responsibility of thinking and acting for themselves, instead of taking that which can be had for the asking.

Higher boiler pressures are needed, the economy of which is beyond all doubt; moreover, high steam generally means *dry steam*, the importance of which cannot be over-estimated. It is well known by engine-drivers that *water* has no effect in propelling the piston, to say nothing of the positive danger of its presence, in the cylinder. The higher the pressure carried, the more work is made available in proportion to the total amount of heat expended.

A combustion-chamber in connection with the fire-box is also wanted, so as to afford what chemistry and practice have shown to be necessary—time and room for the complete development of flame, before its extinction by the flues—the latter being only conduits of heated gases.

The most important of all improvements for complete success in locomotive economy is an independent cut-off valve.

Let any superintendent stipulate that he must have a locomotive which will run 50 miles an hour, hauling a train consisting of four first-class passenger cars loaded, and the coal consumption must not exceed 30 pounds of fuel per train mile on a road bed equal to the Bound Brook or Pennsylvania railroad companies' road. These conditions being complied with, he will order 25 locomotives more at a reasonable advance over a fair price as now paid. I am satisfied he will have any amount of offers on such terms.

In the use of an independent cut-off, Mr. A. J. Stevens, General Master Mechanic of the Central Pacific Railroad, at Sacramento, Cal., has taken the initial step toward making the locomotive as it should be by adopting independent cut-off valves in a twelve-wheeled freight locomotive 19 × 30′ cylinder. He writes, "This engine is at work on a grade of 116 feet per mile, with ten degree curves, one right after the other, as closely as they can be laid. The engine has hauled up this grade (25 miles in length) a train of 14 freight cars loaded with 20 tons (2,000 pounds to the car). This would be a total load of about 210 tons, not including the weight of engine and tender. This would be a heavy load for two of our largest ten-wheeled locomotives with 18″×24′-cylinders and weighing 40 tons.

The working of this locomotive has been so satisfactory that the company has ordered 25 more of the same kind, and at the present writing three of this order are ready for use.

I fully agree with Mr. Stevens. It is the proper valve gear for both freight and passenger service, and it will win. Combine this with high boiler-pressures, and a properly constructed combustion-chamber and the "day is ours."

The Shaw locomotive is also another step in the right direction, if they can demonstrate all that is claimed for this engine, to wit: Counterbalancing all reciprocating weights; doing away with sinuous motion (this, the writer is satisfied, has been accomplished) and hammer blows upon the rail.

In the use of liquid fuel it is claimed that a decided step has been taken in the Holland locomotive boiler, by generating hydrogen gas as required, from oil and steam. The process used is simple, giving clean, quick and intensely hot fire, being entirely under control of the engineer, *free from all sparks, smoke, gases or cinders.*

If the above can be demonstrated beyond doubt, there are also other great advantages to be obtained from the use of hydrogen gas. It is well known to engineers that the best merchantable coal used under boilers, with the most approved appliances of grates, combustion chamber and air-admission, produces only about 10,000 units of heat, whereas hydrogen gas will produce, under the same circumstances, 60,000 units of heat—again in favor of the use of the latter 83.33 per cent.

$$\frac{(60{,}000 - 10{,}000) \times 100}{60{,}000} = 83.33 \text{ per cent.}$$

or, in other words, one pound of good average coal will only evaporate 10 pounds of water from 212 degrees, whereas one pound of hydrogen gas will evaporate 60 pounds.

Another advantage in the use of liquid fuel is that it has a definite temperature of combustion, which is, moreover, very low in the scale, and hence produces its heating effect through a very long range. The heating effect commences at once upon ignition.

I predict that the day is not far distant when locomotive boiler pressures will be common at 200 pounds per square inch, and independent cut-off valves will be in general use. The results will be that the consumption of fuel per train mile will not exceed 25 pounds, in place of 50 pounds, as now used in our fast express locomotives.

Continuous Brakes on French Railways.

M. Hérisson, the French Minister of Public Works, has found it necessary to put fresh pressure upon the railway companies, to induce them to furnish proper security for their passengers. On Sept. 13, 1880, a ministerial circular was issued, enjoining all railway companies, within a space of two years, to supply with continuous brakes all their passenger trains running at a rate of 37 miles per hour and upwards. The time has elapsed, but the companies are still experimenting. In last November the state railways were trying the vacuum brake, the Westinghouse automatic, and the Achard electric brake; the Eastern company the two latter; the Western, Southern companies, and Paris, Lyons & Mediterranean the Westinghouse brake; while the Orleans Company remained undecided between the vacuum and Westinghouse brakes, the Hèberlein chain brake, and a new compressed air-brake, invented by M. Wenger. M. Hérisson has now issued a circular, informing the companies that sufficient time has now been allowed for experiment, and that it is necessary for them to make a definite choice. He distinctly disallows the chain brakes as unsatisfactory for ordinary use, and apparently desires to see the Westinghouse system generally adopted. A technical committee appointed to consider the subject reported against the adoption of a uniform system on all the lines as tending to discourage invention and hinder the introduction of improvements, while M. Hérisson, in setting forth pointedly the alleged merits of the Wenger brake, concludes by leaving the companies entirely free to adopt any model which is both continuous and automatic. Whatever type they adopt must be fully applied in the course of the present year. Considering that the Wenger brake is an apparatus with which very little experience has yet been obtained, it is, to say the least of it, singular to find a Minister of Public Works regarding it as apparently an equivalent for the Westinghouse brake, the efficiency of which has been so exhaustively tested under all conditions of working and with such excellent results.—*Engineering.*

Committees of the Car-Builders' Association.

The following committees have been appointed to report on the subjects named to the next annual convention of the Association, to be held at Chicago on the second Tuesday in June next:

1. *On Links and Pins.*—The committee to recommend a standard form and proportions for coupling links and pins: Howard Fry, New York, West Shore & Buffalo Railway, Mills Building, 15 Broad street, New York; Richard Soule and Sanford Keeler.

2. *On Iron Cars.*—The committee to report whether it would be profitable to railroad companies to substitute iron or steel for wood in the construction of any, and if so which, of the parts of cars now made of wood: W. R. Davenport, Erie Car Works, Erie, Pa.; E. A. Olmstead.

3. *On a Standard Wheel Gauge and Form of Section for the Treads and Flanges of Wheels.*—The committee to report what action, if any, is required with reference to the adoption of a standard wheel gauge and to recommend a standard form of section for the treads and flanges of wheels, and whether experience indicates that any advantage results from the use of a conical form for the treads of wheels, and if so, how the advantage is shown. R. C. Blackall, Delaware & Hudson Canal Co., Albany, N. Y.; D. Hoit and Edward B. Wall.

4. *On Sharp Flanges.*—Their cause and prevention. H. Stanley Goodwin, Lehigh Valley Railroad, Bethlehem, Pa.

5. *On the Causes of Accidents to Trainmen.*—The committee to report what means can and should be provided to protect train and yardmen from injury. W. F. Turreff, Cleveland, Columbus, Cincinnati & Indianapolis Railway, Cleveland, O.; John Kirby and Wm. Fuller.

6. *On the Most Economical Carrying Capacity for Freight Cars.*—The committee to report what are safe and economical loads for axles of given sizes. John Kirby, Lake Shore & Michigan Southern Railway, Cleveland, O.; Wm. Fuller.

7. *On the Economy of Grinding Cast Iron Car Wheels.*—L. Packard, Baltimore & Ohio Railroad, Baltimore, Md., D. C.; Richardson and John Hodges.

8. *On Steel Tired Wheels with Wrought Iron Centres.*—The committee to report on their safety and cost of service compared with chilled cast-iron and paper wheels. F. D. Adams, Boston & Albany Railroad, Allston, Mass.; J. W. Marden.

9. *On Refrigerator Cars.*—The committee to report what it knows or can learn on that subject, and whether it is more economical for railroad companies to own and run such cars, or whether they should be controlled by other companies and their employes. Thos. Aylesbury, Kansas City, St. Joseph & Council Bluffs Railroad, St. Joseph, Mo.; Jos. Townsend and C. E. Gore.

10. *On Heating Cars.*—The committee to report what are the elements of safety, economy and comfort in various methods of heating cars. J. N. Mileham, New York, Lake Erie & Western Railroad, Jersey City, N. J.; C. E. Garey and J. W. Marden.

11. *On Standard Freight and Passenger Car Trucks.*—Wm. McWood, Grand Trunk Railway, Montreal, Canada; Robt. Miller.

12. *On the Decoration and Furnishing of Passenger Cars.*—The committee to indicate the principles which should control the interior and exterior decoration of passenger cars, and how both it and the comfort of cars may be improved. T. A. Bissell, Barney & Smith Manufacturing Co., Dayton, O.; J. S. Lentz and W. B. Snow.

13. *On Brake Shoes, Brake-Beams and the Interchangeable parts of the Brake Arrangements of Cars.*—Howard Fry, New York, West Shore & Buffalo Railway, Mills Building, 15 Broad St., New York; J. S. Lentz, F. M. Wilder.

English Fast Passenger Engine.

The express passenger engine having 18-inch cylinders and four-coupled, 7 ft. driving wheels, with four-wheeled bogie in front, under the smoke-box, designed by T. W. Johnson, for the traffic of the Midland Railway (England), is supported on a wheel-base of 21½ feet in length. The engine weighs about 42 tons in working order, and with tender, including coal and water, about 68 tons. The average load taken by engines of this class is 14 carriages, at the time-table speed of 50 miles an hour, over gradients of from 1 in 120 to 1 in 130, with a consumption of 28 pounds of coal per mile run. The engine can take, as a maximum load, 17 carriages between Manchester and Derby, either way over ruling gradients of 1 in 90 and 1 in 100 for 10 miles, at a speed, up the grades, of 35 miles per hour; and on a level, or on falling gradients, at 50 miles per hour. The curves on the Manchester line are very frequent. The carriages weigh, with passengers, 11 tons each, making a train of the gross weight of 187 tons. The express passenger engines on the Great Northern Railway, designed by Mr. Patrick Sterling, having 18-inch cylinders, and 8-feet single driving wheels, weigh, in working order, about 38 tons, of which about 16 or 17 tons weight is upon the driving wheels. They work the express trains between King's Cross and York. Engines of this class take trains of from 16 to 22 carriages. On one occasion a run of 15 miles was made in 12 minutes, with 16 carriages of from 10 to 12 tons each. These engines can take a gross load, including the engine and tender, of about 350 tons, on a level, at a speed of 45 miles per hour, with a steam pressure in the boiler of 140 pounds per square inch.

BOOK NOTICES.

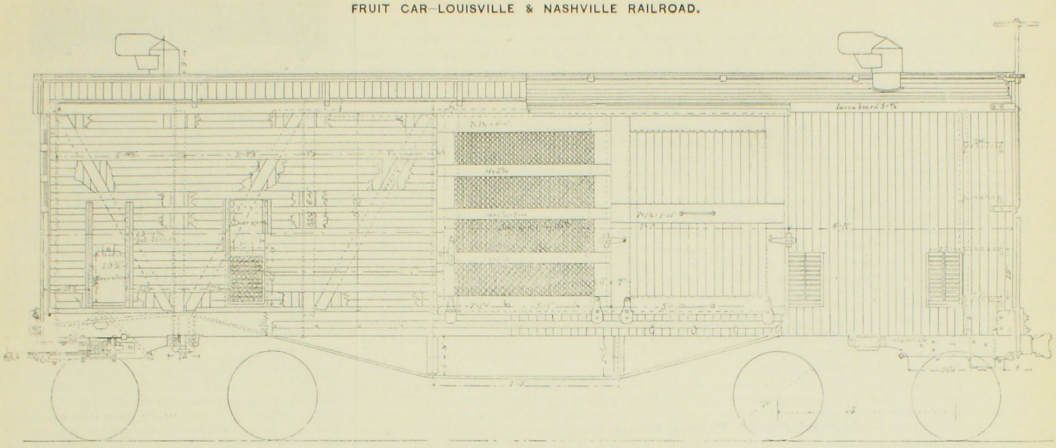
The Materials of Engineering: In 3 Parts. Part 1, Non-Metallic Materials—Stone, Timber, Fuels, Lubricants, etc. By Robert H. Thurston, A. M., C. E. The attainments of the author of this book in the field of mechanical and scientific research are so widely known and appreciated, that anything more than the mere announcement of this publication would almost seem superfluous. The present volume is devoted to the class of materials above named, and is to be followed, as we infer, by two others, in which the other materials used in engineering will be classified and treated of. The arrangement of the matter comprised in this first volume is most admirable, presenting in compact form, with a complete table of contents and alphabetical index for easy reference, a vast amount of information and technical formula of the greatest value, not only to the engineering profession, but to practical mechanics of every class, and especially those connected with the locomotive and car departments of railroads. One of the most interesting portions of the book is contained in the 115 pages devoted to the subject of timber, its characteristics, adaptations and methods of preservation. These chapters are embellished with a number of handsome engravings, and are of special interest to car-builders and others who are identified with the various branches of wood construction. The chapters on Fuels and Lubricants are also replete with valuable information for those in charge of locomotives and railway rolling stock of every kind. The book is beautifully printed in large, clear type, on fine paper, and contains 364 pages. Published by John Wiley & Sons, 15 Astor Place, New York.

Saw Filing, a Practical Treatise in Popular Form. By Robert Grimshaw. This little book is designed as a practical aid to those who use saws for any purpose. It also discusses the questions of gumming, spring-setting and swaging, from the stand-point of present usage. The author's familiarity with this and kindred subjects will render this treatise of special service to sawyers. It is illustrated with numerous engravings, and suggestions and questions are solicited for use in future editions. Published by John Wiley & Sons, 15 Astor Place, New York.

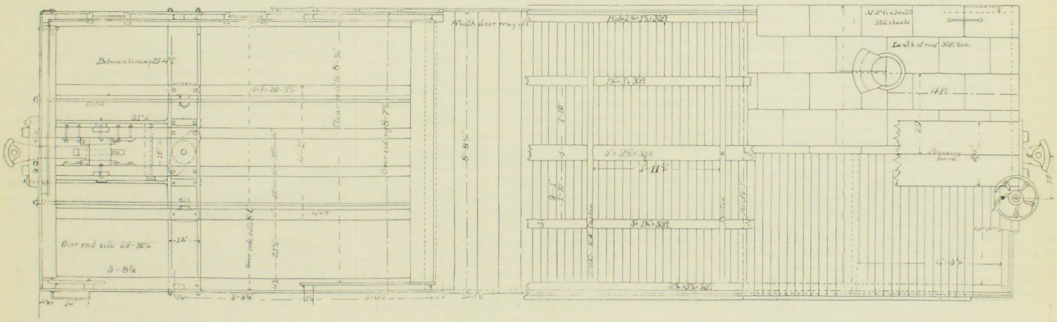
Fifteenth Annual Report of the American Railway Master Mechanics' Association.—This report is in the usual form, and contains the reports of committees and discussions at the meeting last June at Niagara Falls. As a presentation of the views of the most capable and experienced locomotive builders connected with railway and contract shops, upon the numerous plans and devices of improved construction that are now attracting attention, the report is extremely interesting. Although the committee on new construction and improvements refer somewhat discouragingly to the shortcomings of the "Fontaine" engine in connection with a vicious fling at the "Keely Motor," it is at the same time admitted that substantial progress is making in the construction of good and serviceable engines both for fast passenger and heavy freight trains. Considerable attention is given to steam reversing and valve gear, also to side-rod construction and safety attachments, all of which are illustrated with drawings. A good deal of space is devoted to the discussion of the Joy gear and Webb's compound locomotive. Any new departure which involves such an important change as the substitution of the Joy gear for the link motion, suggests the pertinent inquiry as to the advantages that are to be gained by it. This question was raised, and the discussion which followed is a valuable record of the views of the members who took part in it. The report of Mr. Wells, of the Louisville & Nashville road, on boiler construction, is a valuable addition to the several contributions he has hitherto made on this important subject. The usual discussion followed. Mr. Johann, of the Wabash road, contributes a paper in reference to experiments with a Baldwin consolidation engine with a Wootten fire-box. The report on new construction is accompanied with drawings of fast passenger engine, "169," of the Central R. R. of New Jersey, the Philadelphia & Reading passenger engine, Strong's driver-coupling and feed-water heater and purifier, and an interesting profile map of mountain railroads, showing the comparative heights at which locomotives are run in Europe and Peru. The report contains 30 pages more than last year's, and is in this and some other respects an improvement on its immediate predecessor.

THE shops of the Wagner Sleeping Car Company, at Buffalo, are a consolidation of the former shops at Albany and Niagara Falls. About 100 men are employed in repainting and upholstering, which is the only work that is now done in the shops. The trucks and car bodies are built at contract and road shops, but as the company has plenty of ground and capital for the extension of shop facilities, it is probable that they will, at no distant day, do all their own work. It is only about three months since they moved into their present quarters. They have 14 cars in the shops constantly, and the Jones Car Manufacturing Company, at Schenectady, are building for them a large number of elegant sleepers. At the Buffalo shops, an old English day-coach, built in Canada, has been reconstructed and made to conform as nearly as possible to modern requirements. The compartment partitions were removed and the numerous side-doors paneled. The outside running-board was also dispensed with. The little oval windows at the top of the sides for admission of light, still remain, but windows of the American style have been introduced in the upper part of the panels occupying the place of the old side-doors. The original shape of the body, however, is preserved, and, at first sight, creates the impression that the sides have rotted out and the roof falling in, the body being narrowest and shortest at the sills and then bulging out like an old-fashioned carpet bag stuffed to repletion. At about midway of its height it loses this dropsical appearance and retreats in a curve to the roof. The ends are round, and the whole structure looks like a flat-bottomed canal boat on two 4-wheeled trucks.

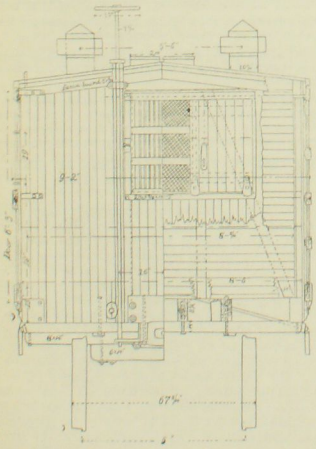
FRUIT CAR—LOUISVILLE & NASHVILLE RAILROAD.



Side Elevation and Section.



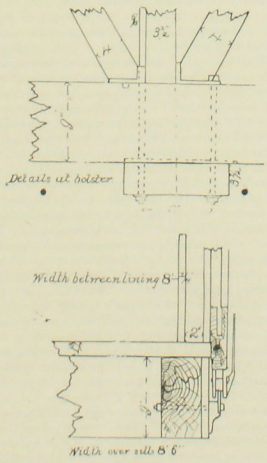
Floor Frame and Roof.



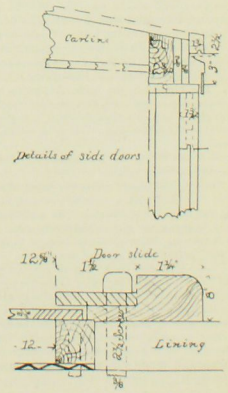
End Elevation and Section.

DIMENSIONS.—Length of body over end siding, 30 ft.; width over siding, 8 ft. 7¾ in.; length of intermediate and center sills, 29 ft. 3¼ in.; length of roof, 30 ft. 6 in.; center to center of trucks, 21 ft.; end of frame to center of bolster, 4 ft. 5⅛ in.; width of door, 5 ft.; height of roof peak above rail, 11 ft. 2 in.; center of draw-bar above rail, 33½ in.

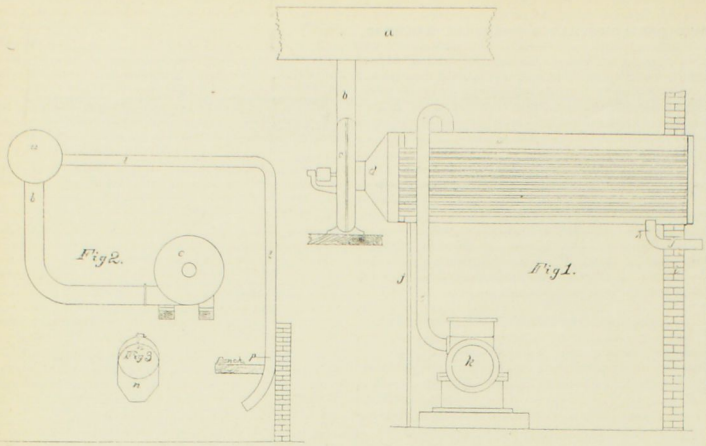
EXTENSIVE plans and surveys have been made for a thorough reconstruction of the New York, New Haven & Hartford road, by straightening curves, removing grades and stone ballasting the track. The rolling stock will in the meantime be brought up to the highest standard of excellence.



THE shops of the New York Central road, at Buffalo, are engaged in rebuilding and repairing from six to eight engines constantly. The different constructions preclude to a considerable extent the use of templets. A very convenient plan for lifting engines to remove the drivers without jacking them up consists of an overhead track directly over the back end of the pits, on which is a traveling windlass that can be pushed over any of the pits where it is wanted. A bar of iron is placed across the inside of the fire-box door, the windlass chain is hooked to it and two men at the windlass can readily hoist the back end of an engine clear of the drivers. This method requires less time, costs less and is much more convenient than a drop-table.



"Two new sleeping cars," says *London Iron*, "specially constructed by the Pullman Company on what is called the English pattern, arrived on Tuesday night at King's Cross station. These carriages differ from those at present in use in having side entrances, thereby dispensing with the end platforms, and in being divided into four compartments, so as to combine the comfort, and to a certain extent, the privacy of an English first-class carriage with the convenience of the sleeping car. Each compartment contains cushioned seats as well as berths and beds for four persons. There is a continuous passage from one end of the car to the other for the use of the attendant, but ordinarily each section is separated from the rest by doors and curtains. The new cars are each rather over twelve yards long and weigh about thirteen tons. They were built in America, shipped to England in sections, and put together and finished at Derby, and have been named "Balmoral" and "Culross."



Improved Plan for Warming Railway Shops.

The usual method of heating railway shops with steam is liable to some drawbacks in an economical point of view, and also with respect to convenience. It sometimes happens that when a shop is fairly warmed in this way, especially in midwinter, when the temperature is considerably below freezing, that there is not steam enough left in the boiler to keep the engine moving at the desired speed, and this, in connection with the necessary renewal of the heating pipes at intervals of five years or thereabouts, is an objection to the system which seems to render some better method desirable. The accompanying drawings illustrate a method which is designed to obviate these difficulties, and also promote healthful ventilation by furnishing a constant supply of fresh outside air, but properly warmed before being introduced into the shop. The plan was adopted in a certain instance for a new or enlarged shop building, and after a full discussion of the subject. The result was an unlooked-for success.

A brief description, with the aid of the engravings, will afford a clear idea of the arrangement. The cylinder part of an old locomotive boiler was cut away from the fire box, a flue sheet riveted into the back end and the flues reset. This boiler was then mounted, as shown in Fig. 1, the end of it projecting through the shop wall *i*. Into the top of the opposite end is inserted the exhaust pipe *e* from the engine *k*. At the same end is fitted a hood *d*, which is connected with a fan *c*. The opening on the opposite side of the fan is closed, so that the only inlet for the outside air is through the flues and hood, the fan delivering it through the pipe *b* to a main *a* extending centrally overhead the entire length of the shop. The engine, when started, exhausts into the boiler *f*, the exhaust steam circulating round the outside of the flues, and finally escaping into the outer air through the pipe *g*, which has a slide throttle *h*, so that a slight back pressure can be created in the boiler, if necessary, in very cold weather. The fan *c* is driven from the main line of shafting, drawing the pure outside air through the flues, causing it to absorb the heat during its passage, and delivering it thus heated to the main *a*. The fan end of the boiler *f* is set an inch or so lower than the opposite or wall end, and the condensation flows off through the pipe *j* to a tub, from which it is again pumped into the boiler, thus furnishing water free from sediment to be reconverted into steam.

Fig. 2 is an end view of Fig. 1. At convenient distances, say 20 feet or thereabouts, branch pipes *l* are attached to the main *a*, extending to the wall and down under the benches, as shown, each pipe being furnished with a throttle *p*, which is simply a slit cut to half the diameter of the pipe, with a sliding piece, as shown in Fig. 3, *m* being the pipe, *n* the throttle, and *o* the extent to which it is open. Other pipes can be used to convey the warm air to each pit or other parts of the shop as may be required. Both main pipe and boiler can be covered with non-conducting material, so as more perfectly to confine the heat.

In the instance referred to where this method is so successfully employed, the dimensions of the shop were about 80 × 150 feet, the engine, 14 × 28 inch cylinder, running at 90 revolutions per minute. The shop is easily warmed, and the cost of the whole apparatus is less than half the cost of steam heating. The main is about 12 inches, and the branch pipes about 4 inches in diameter, and are made of galvanized iron.

THE commissioners of the National Exposition of Railway Appliances to be held in Chicago, are actively pushing forward the preparatory arrangements, and there is every indication that the enterprise will fully come up to the expectations of its projectors. It is, indeed, more than probable that it will very much surpass their expectations. There is nothing to prevent and everything favor such a result. Railways are the mainspring of all our industries, and the fact that this is the first national exhibition of the appliances used in their operation, will excite a world-wide interest and attract many visitors from abroad, as well as exhibits of foreign railway industries. The transportation facilities are ample, and our railway companies have every inducement to be accommodating in the matter of rates and fares. A list of premiums has been arranged, and prizes of gold, silver and bronze medals will be awarded according to the relative merits of the articles exhibited, but with no second and third premiums. The propriety of this part of the programme is open to question, for the reason that prizes and premiums for alleged superiority in exhibits have ceased to be regarded as conclusive evidence. The practice necessitates a board of examiners or judges who are presumed to be altogether impartial and free from the little weaknesses inseparable from human nature. But every one familiar with the methods and influences that are brought to bear in the contention and scramble for advertising on such occasions, knows that the awards of managers and judges do not determine facts. A series of experiments or tests made under the direction of skillful scientific experts, and a truthful record made of the results, would be far more conclusive as to the merits of such materials, devices and appliances as are capable of being tested, than any number of costly and cunningly wrought medals in gold, silver and bronze. These exhibition baubles have already become obsolete to a considerable extent in the estimation of a discerning public, and they are not likely to grow in favor by making them a feature of the national exhibition of railway appliances at Chicago.

OUR space will not permit us to reproduce the extended comments of the *Railway Review* upon the brief article in our last issue on the performance of locomotives, nor is it necessary that we should do so. The writer deals so largely in generalities that it is difficult to make out precisely what he is driving at, unless it is to demonstrate that his knowledge of steam engines is of the superficial kind. We are free to admit that a higher rate of expansion would diminish fuel consumption, but practical men would obtain such rate, not by enlarging the cylinders and other parts, but by compounding, as Webb and many of the French engineers have done. That this method is a practical success, is evident from the fact that Mr. Webb is building many more compound engines, which he would not be likely to do if his experiment had been followed by the results predicted by the writer in the *Review*. The writer's array of authorities is not only inapplicable, but has a strong smack of quackery. Quoting from Charles T. Porter, with respect to automatic stationary engines, he says, "the cost of attendance would be varied much by the size of the engine," etc. The absurdity of this, so far as locomotives are concerned, is apparent from the fact that on many of our roads the engineers are paid at the rate of about 3½ cents per mile, whether the engine is a 16x24 accommodation engine in the six-inch notch, or a 19x24 freight mogul in the twelve-inch notch. From practical experience with several prominent builders of automatic engines, we know that with a chest pressure of from 70 to 80 pounds per square inch, the practice is to put in a size of engine cutting off between ¼ and ⅓, as will develope the power required. The shortest point of cut-off obtainable with the link is about ⅛, as is well known, and if it could be utilized for a shorter point, it would have been applied in locomotive practice despite the writer's authorities, which have reference to automatics in which from four to five expansions are the rule, while the link motion, owing to early exhaust in short points of cut-off, gives but from two to two and a half expansions. The largest engines in use have been increased from 16x24 to 17, 18 and 19x24 cylinders, and this has resulted in practical economy, or else our intelligent railroad managers have been egregiously fooled. Either this, or the *Review* is on the wrong tack.

THE car shops of Pennock Brothers, Minerva, Ohio, are building 100 flat cars for the Connotton Valley road.

NATIONAL CAR BUILDER

PUBLISHED MONTHLY
BY
R. M. VAN ARSDALE,
MORSE BUILDING.....NEW YORK.

JAMES GILLET, Editor.

FRANK C. SMITH, M. E., ASSOCIATE EDITOR.

FEBRUARY, 1883.

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* THE NATIONAL CAR-BUILDER. *Communications for the attention of the Editor should be addressed* EDITOR NATIONAL CAR-BUILDER.

Advertisements.—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

Special Notice.—*As the* CAR-BUILDER *is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of the month.*

SUBSCRIPTIONS *to the* CAR-BUILDER *will be received, and copies kept for sale, at the following places:*

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L. SCHAFFNER, *Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.*

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THE PRESERVATIVE TREATMENT OF TIMBER FOR RAILWAY CROSS-TIES.

It is universally admitted that our native timber supply is becoming less every year, and although there are vast forests of valuable trees in the Southern States and along the Pacific coast that still remain untouched, these sources of supply being more remote from the chief points of consumption, are subject to increased charges for transportation, and consequently the cost is greater to the consumer. Aside from the constantly increasing demand for every description of timber for an endless variety of manufacturing purposes and for general construction, there is an enormous drain upon our forests for railway construction alone. The yearly consumption for cross-ties for new roads, and for replacing worn-out ties on old tracks, would seem almost incredible could the exact number of these ties be ascertained and stated in figures. To estimate it roughly at 30 millions would probably not be far out of the way, taking our total railway mileage as a basis, and assuming the average life of the ties, now in use, to be about seven years. The annual increase in track mileage, if it is to continue at a rate approximating that of the past year, with a corresponding increase in the great volume of traffic, points to a continuous yearly increase in the consumption of timber for ties for an indefinite period in the future—a home consumption strictly, and not including timber exported for like uses on the roads of foreign countries. How to meet this prospective demand without causing such an excessive draft on our forests as to give to the problem of future supply a much more serious aspect, is a question which is bound to assume a greater importance every year unless some means can be devised to prolong the average life, not only of track ties, but of all tim-

ber used in construction where it is exposed to air, moisture and frequent variation of temperature.

With respect to cross-ties more particularly, attention has of late years been directed to three methods to check the excessive consumption of timber material, namely, preservative treatment, tree-planting and the substitution of iron ties for wooden ones. What is wanted, so far as wood is concerned, is a material that will have twice the durability of the ties now in use, and at the same time cost less, or at all events not any more, for a given period. If the average life could be doubled it would save a vast quantity of growing timber, and also the cost of one renewal for the

the impending evil to s
JOHN
reliance must be upon m
ous kinds of timber now in general use for ties, more
ing, by subjecting it to some kind of preservative treatment that is both effective and cheap. Many processes for accomplishing this have been tried and recommended, some of which are reported as having been very successful in Europe, but as yet they have scarcely passed the experimental stage even there, while in this country none of them are in general use, and very few have been put to a satisfactory preliminary test even. These methods, although various, all aim to render the timber less perishable by expelling the sap and all humidity, and then filling the pores or cells with creosote oil, or with a solution of certain metallic salts, both of which have the quality of arresting fermentation and preventing decay—a treatment somewhat analagous to embalming as practiced upon human bodies to arrest decomposition. These processes are known under many names, the more noted of which are the Kyan, Burnett, Bethell, Hayford and Boucherie methods. The most effective agents appear to be chloride of zinc and creosote, the preservative effect on the timber being about the same for each, but the creosote treatment being twice as expensive as the zinc, the latter is mostly used on foreign railways, and to these we must at present look for the best information extant upon the subject.

With respect to economic results, the reports from the German and Austro-Hungarian roads are the most definite. The ties used are mostly of oak, pine, fir and beech, and nearly one-half of the total number in use have been subjected to antiseptic treatment according to various systems, with a reported increase in their average life over and above the average life of untreated ties, as follows: Oak 6 years, fir 7 years, pine 9 years, and beech 9 years. It is also estimated upon this basis that had the 35 million untreated ties on the same roads been subjected to effective treatment, it would have resulted in a saving of very nearly a million dollars. This is, of course, a general statement, with no detailed information as to the condition of the wood when treated, whether it was perfectly or partially saturated, the nature of the road ballast, bearing surface of the rails, alternations of temperature, etc. It is enough, however, to warrant the suggestion that if these representations are in substantial accord with the facts, the subject is worth looking into on this side the water. If preservative treatment is profitable on European roads, where the scarcity and cost of timber naturally lead to close and careful investigation in order to get at the truth, why cannot the same thing be made profitable here, irrespective of any threatened exhaustion of our existing timber resources? There is no very obvious reason why it cannot, except that it is a new economic rut to get into after being so long accustomed to plentiful supply and wasteful profusion, and everybody knows how difficult it is to introduce innovations in the face of long established usuage, and the prejudices thereby engendered.

The preservation of timber by artificial means has been resorted to more or less in this country for many years in cases where it was to be used for the foundations of heavy masonry and structures of great weight and durability, but for railway ties, telegraph poles, driven piles, and a host of other uses to which timber is applied, its preservative treatment has been little thought of, and nothing very definite has been realized in practice. One thing is quite certain, and that is that soft, porous timbers such as pine, fir, hemlock, spruce, and the like, can be rendered vastly more serviceable and lasting for cross-ties by creosoting or by impregnation with solutions of zinc, than if used in the natural state or with ordinary seasoning, especially upon roads with light or medium traffic and with tolerably good ballasting.

INSANITY OF LOCOMOTIVE ENGINEERS

A new subject affecting the safe running of railway trains is presented in the occasional insanity of locomotive engineers. The cases that occur are not sufficiently numerous to attract much attention, and not enough so perhaps, to warrant the inference that there is anything in the occupation of this class of railway men that is peculiarly calculated to unhinge the mind. Still, it would seem to be a proper subject for investigation by medical experts, in view of the alleged danger from color-blindness, the existence of which was so long unsuspected. As bearing upon the subject, we cite the following instances, assuming that in all probability there are many more of a similar kind that have not been brought to public notice.

A passenger train engineer of thirty years experience on a western road upon which the number of trains had been greatly increased, exhibited all at once an unusual and growing distrust of his fireman, as well as of the other employés on the line with whom he was brought in daily contact. A few months ago, upon the arrival of his train at a city terminus of the road, he refused to allow the city engineer to relieve him, as was the custom, by taking charge of the train until it reached the main depot, although he had like the other regular engineers been relieved in this way for ten years or more. On the following day he became very violent and was taken to an asylum where the physician in charge, after a thorough examination, gave it as his opinion that the extra number of trains had imposed such an unusual strain upon him as to unsettle his mind. After three months treatment he was discharged as cured, and although again employed by the road in another capacity, was not again permitted to take charge of an engine.

On another road, an old passenger engineer in one of his trips ran by several important stations, refusing to stop at the bell-cord signals of the conductor, although he had been on the same run for years, and the stations that he passed were regular stopping places. Upon reaching the terminal station, the superintendent of the road, who had been informed of his doings by telegraph, met him as he was leaving his engine, and asked for an explanation of his conduct. The reply was that the stations were too small to stop at, and that in future he should not stop at them. The next day the evidences of his insanity were so marked that he was taken to an asylum, where he shortly afterwards died. The opinion of the physician in this case was, that the constant mental strain for many years, and a morbid fear of not being able to make time, was more than he was equal to, and that the result was a disordered mind. Fortunately, these cases were not attended with any accidents to the trains, but they are suggestive of a new element of danger in railway travel, which is as much deserving of investigation as the alleged inability of engineers, switchmen and others to rightly discriminate colors.

THE SPEED OF FREIGHT TRAINS.

There are not a few railway men who are confidently looking forward to the time when the speed of both passenger and freight trains will be greatly increased over what it now is, with a corresponding increase in the service performed, and consequently in net earnings. As regards passenger trains, it is extremely doubtful whether these anticipations are likely to be realized with the present capacity of locomotives and the average weight of trains, the reasons for which it is not our purpose to state here, although they must be sufficiently obvious to any one who has given much attention to the subject. With respect to freight trains, it is the prevailing impression that as soon as the present hand-brake system shall be superseded by power-brakes that will give engineers the same control over trains in making stops that they now have over passenger trains, the average speed of ordinary freight will be twice what it now is—say 25 miles an hour, and "fast freight" not less than 30 miles an hour. This gain in speed might be counted on with tolerable certainty if it were alone contingent upon improved brakes. But there are other things to be considered, the most important of which is weight. The maximum freight car load is now 40,000 pounds, with a strong tendency towards a higher figure. The cars must also be heavier in proportion to the load. The average number of cars per train, according to the reports, will range above 30 on most of the roads that do a large freight business. This, however, is only an average. The number of loaded 8-wheel cars in many trains is very much more than this figure, a good deal depending on curves and grades. On the New York Central, 50 loaded cars are not considered a remarkably heavy train, and this number is, we believe, below the maximum on that road. We do not know what the average or maximum is on the Boston & Albany, but with its grades and curves, the trains must be considerably lighter than on a comparatively straight and level road like that of its immediate western connection. The weight of trains must vary, of course, according to the conditions of track; but as respects the matter of weight, in the fast running that is to be inaugurated with the advent of a freight train power-brake, let us take a train of say 40 loaded cars, the weight of which at a moderate estimate, is not less, but rather more, than 1,000 tons, and contrast it with an ordinary passenger train of 10 coaches, the weight of which may fairly be put at 300 tons, making no account of engine and tender in either case, although the freight engine must necessarily be much the heaviest. Here we have an excess of weight in the freight train of 700 tons, which represents a factor in the coming fast freight movement that can not well be made light of.

It is not proposed, we believe, to diminish the present weight of trains in order to secure greater speed, as that would lessen the anticipated benefits by buying them at a price that might be more than an equivalent. It is manifest, also, that in order to reach and maintain an average of 25 miles an hour, the speed of a great many trains must be very much above the average to make up for what must necessarily fall below it on lines with exceptionally heavy grades and numerous curves, and there are plenty of such lines or parts of lines. Now, it would be interesting to know from an engineering point of view, provided the profession can agree about it, what is likely tobe the effect of this speed and weight upon rails and road-bed in the matter of repairs, detentions, increased liability to accident, etc. It is said to be a rule which has no exception, that train resistance increases as the square of the velocity. If this is so—and there can be no doubt of it whatever—it is clear that doubling the speed of a loaded freight train weighing 1,000 tons, more or less, (weight and resistance being convertible terms in such case) the tax upon the engine must be very greatly increased, which involves increased wear and tear, consumption of fuel, and all that. It may also be asked what effect this accelerated speed is to have on cars and track, such as we have now. How will the great and diversified assortment of freight trucks stand the strain of speed and power-brake stops? As well as passenger car trucks under the same conditions, it may be said. In point of adaptation to speed an average freight truck bears about the same relation to a passenger truck as a cart horse does to a carriage horse. It is an inferior piece of construction, and is less perfectly protected by springs from the poundings of the car body and load. It is sufficient, however, for the present demands of the service and the average freight train speed.

The time may possibly come when freight trains may be profitably run at the rate of 25 or even 30 miles an hour, but it must be accompanied with conditions with respect to cars and track which only imperfectly exist now. We can not but think that even under the most favorable conditions for fast running, the present slow movement will be found most profitable, but the trains should be heavy and the engines powerful enough to haul them.

THE NEW COMMITTEES OF THE CAR-BUILDERS' ASSOCIATION.

On another page will be found a list of the committees that have been appointed to report upon the subjects named at the next annual meeting. These subjects, as will be seen, embrace a number of familiar topics upon which committee reports have been made in years past, and which have been repeatedly discussed at former meetings of the association. Yet, notwithstanding this, they are as fresh and as full of interest as ever. This is readily accounted for by the fact that the investigations and discussions have hitherto been to a great extent partial and inconclusive, resulting in nothing very definite, and leaving the various problems in nearly as unsettled a condition as before. There is something about these new committees, however, and the work that has been laid out for them under the auspices of the reorganization at Niagara, that seems to give promise of better results. What they are expected to report with respect to all, or nearly all, of the subjects named, is stated with a precision that leaves no room for doubt. A standard is to be recommended for coupling-links and pins. If iron or steel can be substituted with advantage for any of the parts of cars that are now made of wood, those particular parts are to be designated. Standard forms of sections for wheel-treads and flanges are to be recommended, and the advantages of coning shown. The causes of sharp flanges are to be ascertained, and how to prevent them; also, what are safe and economical loads for axles of given sizes. The comparative economy of steel-tired wheels with wrought-iron centers, and chilled cast-iron and paper wheels, is to be shown; also the economy of grinding cast-iron wheels. The refrigerator car system is to be looked into, the protection of trainmen, and several other subjects pertaining to the construction and management of cars.

The work to be done is certainly well laid out. The selection of subjects, as well as of the gentlemen who have been placed at the head of the respective committees, evinces tact and discrimination, the distinctively old element in the association having a preponderance in point of numbers over the new. As the efficiency of a committee is largely dependent upon the capacity of the chairman, especially in the matter of preparing and determining the character of the report that is to be made, there is every reason to expect, from the known ability and experience of the respective chairmen, named in the list, that the forthcoming reports will present such a well digested and well arranged mass of facts and suggestions as to make it unnecessary, except in a few cases, perhaps, to continue the same committees on the same subjects another year. Railway progress has reached a point at which a vastly greater proportion of the business community is directly interested in the economical management of the service than formerly, even to the technicalities and principles involved in the mechanical details. Every specific matter upon which these committees are expected to report next June is very well understood by a great mass of intelligent people outside of railway circles, and especially by inventors, manufacturers, merchants, shippers and other classes. What is said and done at the annual meeting of the association this year, will be scrutinized and judged by a larger audience than in years past, and any failure to meet the responsibilities assumed will not escape attention and comment.

It must at the same time be borne in mind that the committees appointed now, no less than those that have been

appointed heretofore, to ascertain how to remedy defects and reform bad practice, labor under a great deal of embarrassment, owing to a lack of the necessary time for thorough investigation in many lines of inquiry; and what is a still greater drawback, a lack of the facilities which money, skill and organization can only furnish, for making such experimental tests as are absolutely necessary to determine the comparative value of materials and a multitude of forms and proportions that are involved in the construction of what is called the "running-gear" of cars. This is the great obstacle that bars the way to a knowledge of what is *best*, and until such knowledge is more easily attainable than it is at present, there are not likely to be any permanent standards for such forms and proportions, or of other features of construction that are sufficiently complicated to admit of diversity. It is perfectly obvious that the members of a committee whose whole time is scarcely sufficient to enable them to perform their daily duties in their regular occupations, can not give much attention to experimenting and testing, which, to be worth anything in intricate cases, should be conducted under the direction of the highest scientific skill, and occupy of necessity a considerable length of time. Another drawback exists in the fact that the members of a committee often live a considerable distance from one another, and can only meet at long intervals for conference and consultation. We think that when a satisfactory report can not be made for the want of information which can only be obtained through the operations of a well-organized mechanical laboratory, the best plan would be to state the fact and leave the railway companies to take the requisite steps for supplying such an indispensable agency for the solution of mechanical problems such as the association has to deal with.

AN INVENTION WITH MILLIONS IN IT.

The most thrilling "send-off" in the way of a newspaper puff of a new invention designed to effect a "revolution" in railroads, that we have met with for some time, appears in a recent number of the San Francisco *Daily Exchange*. We are afraid to copy it entire, lest its amplitude of assertion and stupendous claims in behalf of the new discovery, would throw the mental machinery of our readers "out of square," so to speak. So we will tone down and condense it a little. As usual, when a daily newspaper, and especially a California newspaper, announces a local achievement or the discovery of something "in advance of the age," that is to enrich the inventor and save millions upon millions from being wasted, the tendency is to make the most of a good thing while it lasts. The writer, in this instance, is prone to run riot on the hypothetical savings that will result to railroads from the use of the invention to which he calls their attention. He starts out with the reckless assertion that several "frightful accidents" on these roads have been caused by overheated journals. There is also an enormous expenditure for oil and waste, amounting on a certain road that is less than 1,000 miles long, to $52,191.26 in a single year, and on all the roads in the country, to a sum reaching away into the millions. Babbitt metal and brass are also consumed on the same road at an annual cost of $16,950, and as several of the eastern roads use high priced oils, the above estimate gives but an imperfect idea of the actual outlay. The writer then states with a good deal of confidence, apparently, that any system that will obviate this expenditure "will prove highly beneficial and enhance the profits of railroad traffic." But this is not all. It is claimed that by means of this invention, the nature of which will be indicated presently, twice the number of cars and weight of tonnage can be hauled by one locomotive that are now hauled, with less wear and tear, and with a saving in the cost of fuel on a road like the one referred to of $515,030.28 per year. And furthermore, the device is declared to be equally well adopted to street car wheels, trucks, carts and carriages of all kinds, and wherever it is desirable to annihilate friction.

The invention is described as a wheel in which are inserted between the hub and rim a series of steel rollers of different sizes, which are set in motion by the movement of the car, some of the rollers having a reverse motion, and all of them, together with the wheel, revolving independently of the axle, which remains fixed, and assumes of course a radial position in passing curves. The invention is very appropriately called the "Planetary Wheel," a name which was no doubt suggested by the peculiar arrangement of its internal structure and movement, resembling as it does the planetary system of worlds of which the sun is the center, a system that has never been know to get out of order or to need anything more than trifling repairs at very long intervals of time. A car with these wheels can be run, it is said, with perfect safety 200,000 miles at any rate of speed, without friction or lubrication, and with twice the load that is usually carried on ordinary wheels. The fortunate inventor is Mr. H. G. Yates, of San Francisco. The patent is owned by the "Planetary Wheel Manufacturing Co.," of that city. A model of the wheel is on exhibition at the office of the company, and in order to introduce the wheel generally throughout the United States, a limited number of the shares of the company's stock will be sold to organize a working capital.

It is obvious from the "planetary" principles upon which the wheel is constructed, and the extraordinary service it must necessarily be capable of performing, that no trial tests are needed to convince people that a revolution is impending that will make oil and Babbitt metal a drug in the market, reduce the rates of freight to a vanishing point, make one locomotive do the work of two, and unsettle the value of railroad securities until the commercial world gets accustomed to the new order of things. The wheel will doubtless be entered for exhibition at Chicago, and we would suggest that the managers have a special medal prepared to meet the emergency.

AT the December meeting of the Car-Builders' Club, it was voted that the difference between the maximum and minimum limit of gauges for round-iron should be as follows: $\frac{1}{100}$ in. for iron of less than $\frac{1}{4}$ in. diameter; $\frac{1}{64}$ in. for $\frac{1}{4}$ in. iron; and $\frac{1}{32}$ in. for iron more than $\frac{1}{2}$ in. and up to and including $1\frac{1}{4}$ in. diameter. In filling out orders for iron of a specified standard size, say $\frac{3}{4}$ in., the manufacturers are to use two gauges, one $\frac{1}{64}$ in. larger than the standard and one $\frac{1}{64}$ in. smaller, and the bars, when made, must be of a size that will enter the larger gauge but not the smaller one. The limits of variation stated above are understood to be the least that manufacturers can adhere to without increasing the cost of the iron.

CORRESPONDENTS (ostensibly car-builders) who write to us concerning the recent reorganization of the Car-Builder's Association, will incur no very great risk if they should inclose their cards when they write—not that the names of such correspondents should necessarily be published with their communications, but simply as an evidence of good faith. If there is discontent and dissatisfaction among any of the so-called "old members," there is nothing gained by allowing it to smoulder. Speak out and let your grievances be know, even if the heavens fall. We are in favor of free speech, tempered, of course, with moderation.

APPLICATIONS for space at the Chicago Exposition of Railway Appliances are made from every State and territory and from most foreign countries in which railways are operated, and the complete success of the exposition is assured beyond question. There will be an electric passenger railway around the inside of the gallery of the main building during the exposition, the length of which will be one-third of a mile, also a gravity road to carry passengers.

THE *Mechanical Engineer* begins the new year with substantial evidence of prosperity. Its recent enlargement, together with its handsome typography, well edited reading matter and numerous illustrations makes it one of the most attractive publications of its class. It should be in the hands of all practical mechanics.

WE are in receipt of a handsomely illustrated circular and price list of the Allen Paper Car Wheel Co., containing full size section drawings of the several classes of wheels manufactured by the company; also sectional views of its standard wheels, with dimensions, for the convenience of its patrons in ordering. These last-named wheels are always kept in stock and can be shipped at once.

The firm of John Jewett & Sons, of New York, manufacturers of white lead and linseed oil, has dissolved by limitation. The manufacture of Jewett & Sons' pure white lead will be continued by the Jewett White Lead Co., and the linseed oil and linseed cake by the new firm of J. A Dean & Co.

THEO. W. MORRIS & Co., importers of plate and sheet glass, have removed to 440, 442 and 444 Canal, and 12, 14 and 16 Vestry streets, New York.

Carelessness in a Printing Office.

A local reporter for a down-east newspaper prepared two articles for publication, one being an account of the presentation of a gold-headed cane to the Rev. Dr. Mudge, the clergyman of the place, and the other a description of a patent hog-killing and sausage machine just put in operation. The foreman of the office, in making up the forms, got the two articles mixed, and the paper was issued with the sense and substance of each blended as follows:

"Several of the Rev. Dr. Mudge's friends called upon him yesterday, and after a brief conversation the unsuspecting hog was seized by the hind legs and slid along a beam until he reached the hot-water tank. His friends explained the object of their visit, and presented him with a very handsome gold-headed butcher, who grabbed him by the tail, cut his throat from ear to ear, and in less than a minute the carcase was in the water. Thereupon he came forward and said there were times when the feelings overpowered one, and for that reason he would not attempt to do more than thank those around him for the manner in which so huge an animal was cut into so many fragments was simply astonishing. The doctor concluded his remarks, when the machine seized him, and in less time than it takes to write it, the hog was cut into small chunks and worked up into delicious sausage. The occasion will long be remembered by the doctor's friends as one of the most delightful of their lives. The best pieces can be obtained at fifteen cents a pound, and we are sure that those who have sat so long under his ministry will rejoice that he has been so handsomely treated."

The next day the office of the newspaper was surrounded by the members of the doctor's congregation, armed with rawhides, feather beds and several buckets of tar, but the foreman escaped through the scuttle and was last seen sliding down the lightning rod of an adjoining building.

THE Michigan Car Company has recently built a refrigerator car on a new principle for the use of the Great Eastern Freight Line. It is arranged to be used for both winter and summer shipments of farm produce liable to injury from cold or heat. The body of the car is built with an inner and outer shell, both air-tight, and forming a vacuum or dead air between. The inner shell has a matched lining which gives a more finished appearance to the interior, and acts as a protection to the air-chambers. For summer use there are two openings in the roof, where ice may be placed in compartments provided for the purpose. It is said cars built in this manner are much better for all seasons of [illegible] satisfaction

FRANK C. SMITH, M. E., ASSOCIATE EDITOR.

FEBRUARY, 1883.

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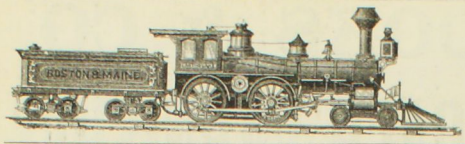
Employment.

Advertisements will be inserted under this heading for one dollar for each insertion.



MANCHESTER LOCOMOTIVE WORKS,

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LOCOMOTIVES,

AND THE

AMOSKEAG STEAM FIRE-ENGINE.

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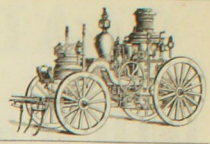

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BOSTON, MASS.,

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FOR ALL GAUGES.

Best workmanship and interchangeability of parts guaranteed.

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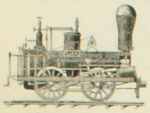
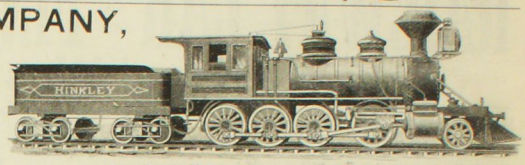
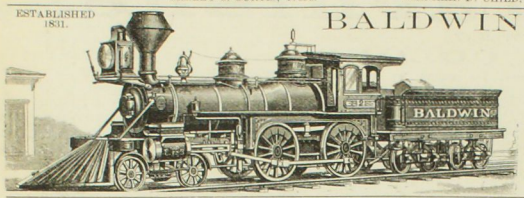


LI.N, 10 TONS, HINKLEY, 1881.



CONSOLIDATION, 52 TONS, HINKLEY LOCOMOTIVE COMPANY, 1882.

ESTABLISHED 1831.



BALDWIN LOCOMOTIVE WORKS,

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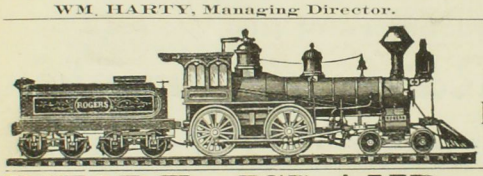

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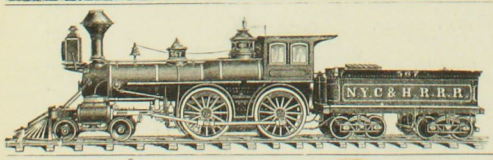

SCHENECTADY LOCOMOTIVE WORKS.

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WALTER McQUEEN, Vice-President.

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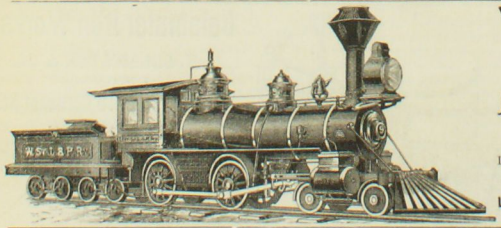

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of the Railroads of the United States and Canada, showing the gauge, length of road, number of locomotives and number of cars; and giving the names and titles of their principal officers in charge of the operating, purchasing and rolling stock departments.

A

Adirondack R. R. 4-8½ gauge 60 m. 3 lo. 62 cars
C. E. Durkee, *Supt* .... Saratoga, N. Y.
Jacob Myers, *M. M.* .... Saratoga, N. Y.
Jas. J. Traver, *M. C. B.* .... Saratoga, N. Y.
Alabama Great So'n R. R. (*See Cin., N. O. & T. P.*)
Albany & Susquehanna R. R. (*See D. & H. Canal Co.*)
Albert Ry. 4-8½ g. 51 m. 3 lo. 32 cars
G. A. Robinson, *Manager* .... Hillsboro, N. B.
Jas. McKay, *M. M. & C. B.* .... Hillsboro, N. B.
Allegany Central R. R. 3 gauge 30 miles
Geo. D. Chapman, *Gen. Man.* .... Angelica, N. Y.
W. O. Chapman, *Gen. Supt* .... Friendship, N. Y.
Allegheny Valley R. R. 4-9 g. 259 m. 70 lo. 2200 c.
David McCargo, *Gen. Supt. & Pur. Agt.*; and
C. B. Price, *Supt.* (Riv. Div.) .... Pittsburg, Pa.
A. A. Jackson, *Supt.* (L. G. Div.) Reynoldsville, Pa.
Geo. W. Glass, *M. M.* .... Verona, Pa.
R. Gunning, *M. C. B.* .... Verona, Pa.
Annapolis & Elk Ridge R. R. 4-8½ g. 20 m. 4 lo. 29 c.
W. H. Bians, *Supt. & Pur. Agt.* Annapolis, Md.
John L. Beall, *M. Mach* .... Annapolis, Md.
Arkansas Midland R. R. 3-6 g. 48 m. 4 lo. 45 cars.
A. H. Johnson, *Pr. & Gen. Man.* .... Helena, Ark.
J. B. Johnson, *M. M. & M. C. B.* .... Helena, Ark.
Ashland Coal & Iron Ry. 4-8½ g. 30 m. 7 lo. 425 c
Douglas Putnam, Jr., *Gen. Supt.* Ashland, Ky.
Robt. Peebles, *Pur. Agt* .... Ashland, Ky.
E. M. Roberts, *M. M.* .... Ashland, Ky.
Ashtabula & Pittsburgh Ry. (*See Penna. Co.*)
Asheville & Spartanburg R. R. 5 g. 49 m. 2 lo. 12 c.
Jas. Anderson, *Supt. & Pur. Agt.* Spart'b'g, S.C.
Wm. Platt, *M. M.* .... Spartanburg, S. C.
W. B. Brown, *M. C. B.* .... Spartanburg, S. C.
Atchison, Topeka & Santa Fé R. R.
4-8½ g. 1,900 m. 347 lo. 9,607 cars.
C. C. Wheeler, *Gen. Man.* .... Topeka, Kan.
D. J. Chase, *Gen. Supt* .... Topeka, Kan.
W. W. Allen, *Asst. Supt* .... Topeka, Kan.
F. M. Smith, *Pur. Agt* .... Topeka, Kan.
Geo. Hackney, *Supt. Lo. & Car. Dept* do.
Clem. Hackney, *Asst. Sup. L. & C. Dept.* do.
Eastern Div.: C. M. Rathbun, *Supt.* .Topeka, Kan
Henry Hull, *G. F. Car Dept* .... Topeka, Kan.
John Fagan, *M. M.* .... Atchison, Kan.
J. M. Smith, *M. M.* .... Kansas City, Mo.
Alfred Taylor, *M. M.* .... Emporia, Kan.
Mid. Div.: H. R. Nickerson, *Supt.* Nickerson, Kan.
W. Y. Johnson, *M. M.* .... Nickerson, Kan.
J. Q. Adams, *M. M.* .... Dodge, Kan.
Col. Div.: W. W. Borst, *Supt* .... La Junta, Col.
A. C. Stiles, *M. M.* .... La Junta, Col.
D. H. Dotterer, *M. M.* .... Raton, N. M.
Las Vegas D.: Geo. L. Sands, *Supt.* Las Vegas, N.M.
L. H. Waugh, *M. M.* .... Las Vegas, N. M.
Rio G. Div.: Geo. L. Sands, *Supt.* Las Vegas, N.M.
J. H. Holman, *M. M.* .... Wallace, N. M.
J. W. Sager, *M. M.* .... San Marcial, N. M.
H. P. Olcott, *M. M.* .... Deming, N. M.
Atlanta & West Point R. R. (*See Western of Ala.*)
Atlantic & Pacific R. R. 4-8½ g. 286 m.
F. W. Smith, *Gen. Supt* .... Albuquerque, N. M.
B. W. Angell, *Div. Supt* .... Albuquerque, N. M.
Geo. Chalender, *Supt. M. P. & M.* do.
D. B. Sibley, *Pur. Agt* .... Chicago, Ill.
Augusta & Knoxville R. R. 30 miles.
Gen. Supt & M. M. .. Augusta, Ga.

B

Baltimore & Ohio R. R.
4-8½ g. 1,539 m. 546 lo. 14,862 cars.
N. S. Hill, *Pur. Agt* .... Baltimore, Md.
E. Ohio Riv. Div. 4-8½ g. 972 m.
W. M. Clements, *Mast. Trans* .... Baltimore, Md.
N. E. Chapman, *Mast. of Mach.* .Baltimore, Md.
A. J. Cromwell, *Asst. M. of M.* .. Baltimore, Md.
L. Packard, *M. C. B.* .... Baltimore, Md.
I. N. Kalbaugh, *M. M.* .... Baltimore, Md.
Wm. Edwards, *M. M.* .. Martinsburgh, W. Va.
Sam. Houston, *M. M.* .... Piedmont, W. Va.
Robert Maxwell, *M. M.* .... Cumberland, Md.
S. B. Crawford, *M. M.* .... Grafton, W. Va.
Alex. Laird, *M. M.* .... Parkersburg, W. Va.
Chas. Hirsch, *M. M.* .... Wheeling, W. Va.
Pitts. Div.: T. M. King, *Gen. Supt* .... Pittsburg, Pa
J. E. Sampsell, *Asst. M. of M.* Connelsville, Pa.
Trans-Ohio Divs.: B. Dunham, *G. Man* .Newark, O.
W. H. Harrison, *Asst. M. of Mach.*, Newark, O.
E. L. Weisgerber, *M. M.* .... Newark, O.
H. M. Ingler, *M. M.* .... Bellaire, O.
O. B. Perkins, *M. M.* .... Zanesville, O.
Andrew Beckert, *M. M.* .... Sandusky, O.
F. J. Gunther, *M. M.* .... Chicago Junction, O.
Chi. Div.: John Thomas, *Gen. Supt.* Chicago, Ill.
Benj. Lowther, *M. M.* .... Garrett, Ind.
W. H. Wilkinson, *M. M.* .... Kingston, Ill.
Baltimore & Potomac R. R. (*See Penna. R. R.*)
Bangor & Piscataquis R. R. 4-8½ g. 63 m. 4 lo. 87 cars.
Arthur Brown, *Supt* .... Bangor, Me.
C. S. Nason, *M. M.* .... Bangor, Me.
J. W. Comins, *M. C. B.* .... Oldtown, Me.
Barclay R. R. 4-8½ g. 16 miles.
F. F. Lyon, *Supt* .... Barclay, Pa.
J. A. Hardenburg, *Pur. Agt.* .21 Cort. st., N. Y.
Wm. Johnson, *M. M.* .... Towanda, Pa.
Bedford, Springville, Owensburg & Bloomfield Ry.
3 g. 41 m. 5 lo. 65 cars.
Jas. W. Kennedy, *Gen. Supt. & Pur. Agt.*; and
Capt. Geo. Elliott, *M. M.* .... Bedford, Ind.
Richard G. Elliott, *M. C. B.* .... Bedford, Ind.
Bellaire, Zanesville & Cin. Ry. Co. 3 g. 42 m. 3 lo. 29 c.
S. J. Cochran, *Mast. Trans* .... Bellaire, O.
Bell's Gap R. R. 3 g. 23 m. 4 lo. 139 cars.
R. G. Ford, *Supt* .... Bellwood (P. O.), Pa.
A. Zimmerman, *M. C. B.* .... Bellwood, Pa.
Bennington & Rutland Ry. 4-8½ g. 9 m. 10 lo. 214 c.
F. C. White, *Supt. & Pur. Agt.* .Bennington, Vt.
G. W. Blanchard, *M. M.* .... Rutland, Vt.
Bingham, Canyon & Camp Floyd, and
Wasatch & Jordan Valley R. R.'s.
3 g. 44 m. 7 lo. 300 cars.
J. G. Kennedy, *Gen. Man.* .Salt Lake City, Utah
Geo. M. Young, *Supt* .... do. do.
Bodie Lumber Co. 3 g. 34 miles.
Thomas Holt, *Supt. & Pur. Agt* .... Bodie, Cal
E. M. Luckett, *M. M. & C. B.* .... Bodie, Cal
Boston, Barre & Gardner. 4-8½ g. 36 m. 7 lo. 107 c.
H. M. Witter, *Supt. & Pur. Agt.* Worcester, Mass.
Chas. F. Brigham, *M. M.* .... Worcester, Mass.
Boston Concord, Montreal & White Mts. R. R.
4-8½ g. 167 m. 34 lo. 677 cars
James A. Dodge, *Gen. Man* .... Plymouth, N. H.
J. Thos. Vose, *Pur. Agt* .... Boston, Mass.
R. Adams, *M. M.* .... Lake Village, N. H.
G. A. Ferguson, *Asst. M. M.* .. Lake Village, N. H.
L. D. Pickering, *M. C. B.* .... Lake Village, N. H.
Boston, Hoosac Tunnel & W'n Ry.
4-8½ g. 65 m. 18 lo. 1,038 cars.
H. L. Morrill, *Gen. Man* .... Saratoga, N. Y.
J. L. Butman, *Supt* .... Mechanicville, N. Y.
J. H. Wilder, *Pur. Agt* .... Mechanicville, N. Y.
C. H. Corey, *M. M.* .... Mechanicville, N. Y.
John S. Ellis, *M. C. B.* .... Mechanicville, N. Y.
Boston, Revere Beach & Lynn R. R. 3 g. 9 m. 5 lo. 46 c.
L. C. Legro, *M. of Trans* .... Boston, Mass.
C. A. Hammond, *Supt. & P. Agt.* Boston, Mass.
J. L. Folsom, *M. M.* .... Boston, Mass.
John Coghlan, *M. C. B.* .... Boston, Mass.
Boston & Albany R. R. 4-8½ g. 372 m. 245 lo. 6,111 c.
W. H. Barnes, *Gen. Supt.* .... Boston, Mass.
E. Gallup, *Asst. Supt* .... Springfield, Mass.
A. B. Underhill, *Supt. M. P.* .. Springfield, Mass.
F. D. Adams, *Gen. M. C. B.* .... Allston, Mass.
H. B. Chesley, *Div. Supt* .... Boston, Mass.
G. H. Colby, *Div. M. M.* .... Boston, Mass.
C. E. Grover, *Div. Supt* .... Springfield, Mass.
H. W. Eddy, *Div. M. M.* .... Springfield, Mass.
J. B. Weston, *For. Car Sh.* Springfield, Mass.
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T. B. Purvis, *Div. M. M.* .... East Albany, N. Y.
J. E. Doran, *For. Car Sh.* .East Albany, N. Y.

Boston & Lowell and Concord R. Rs.
4-8½ g. 360 m. 110 lo. 2,211 cars.
H. C. Sherburne, *Man* .... Boston, Mass.
F. H. Nourse, *Pur. Agt* .... Boston, Mass.
J. F. Crockett, *M. Trans* .... Boston, Mass.
Concord Divs.:
H. E. Chamberlain, *Supt. & P. A.* Concord, N.H.
J. T. Gordon, *M. M. & C. B.* .... Concord, N. H.
Boston & Maine R. R. 4-8½ g. 206 m. 89 lo. 2,100 c.
J. T. Furber, *Gen. Supt. & P. A.* .Boston, Mass.
Geo. J. Fisher, *Pur. Agt* .... Boston, Mass.
Wm. Smith, *M. M.* .... Boston, Mass.
D. C. Richardson, *M. C. B.* .... Lawrence, Mass.
Boston & N. Y. Air Line. 4-8½ g. 53 m. 9 lo. 156 c.
Supt .... New Haven, Conn.
Boston & Providence R.R. 4-8½ g. 67 m. 52 lo. 1,006 c.
A. A. Folsom, *Gen. Supt* .... Boston, Mass.
Geo. Richards, *M. M.* .... Roxbury, Mass.
Jno. Lightner, *M. C. B.* .... Roxbury, Mass.
Bradford, Bordell & Kinzua R. R. 3 g. 30 m. 6 lo. 80 c.
B. C. Williams, *Supt. & Pur. Agt.* .Bradford, Pa.
John Delaney, *M. M. & C. B.* .... Bradford, Pa.
Bradford, Eldred & Cuba R. R. (*See Tonawanda, etc.*)
Breakwater & Frankford R. R. (*See Junc. & Break.*)
Brighthope Ry. 3 g. 37 m. 3 lo. 193 cars.
Jas. R. Worth, *Supt* .... Richmond, Va.
A. Gary, *Supt. Way & Works.* Winterpock, Va.
Alex. Calder, *M. M.* .... Chester, Va.
Brunswick & Albany R. R. 5 g. 172 m. 13 lo. 170 c.
R. D. Meader, *Supt* .... Brunswick, Ga.
Buff., N. Y. & Phila. Ry. 3 & 4-8½ g. 242 m. 48 lo. 3,500 c.
Geo. S. Gatchell, *Gen. Supt* .... Buffalo, N. Y.
W. W. Halsey, *Asst. to G. Supt* .Buffalo, N. Y.
J. H. Poole, *Pur. Agt* .... Buffalo, N. Y.
Allen Vail, *Supt. M. P. & M.* .... Buffalo, N. Y.
Buff. Div.: J. T. Gardiner, *Supt* .... Buffalo, N. Y.
Roch. Div.: R. M. Patterson, *Supt.* Rochester, N.Y.
N. G. Div.: J. W. Watson, *Supt* .... Olean, N. Y.
Buff., Pittsburg & W'n R. R. 4-8½ g. 156 m. 331. 975 c.
O. Watson, *Gen. Supt. & Pur. Agt.* Buffalo, N. Y.
E. H. Witter, *Asst. Supt* .... Oil City, Pa.
H. J. Bookhammer, *M. M.* .... Oil City, Pa.
John Monks, *M. C. B.* .... Oil City, Pa.
Burlington, Cedar Rapids & Northern Ry.
4-8½ g. 713 m. 73 lo. 2,738 cars.
C. J. Ives, *Gen. Supt* .... Cedar Rapids, Ia.
Robt. Williams, *Supt* .... Cedar Rapids, Ia.
T. Stickney, *Pur. Agt* .... Cedar Rapids, Ia.
R. W. Bushnell, *M. M. & C. B.* Cedar Rapids, Ia.
Burlington & Lamoille R. R. 4-8½ g. 35 m. 4 lo. 64 c.
G. L. Linsley, *Gen. Man. & Supt.* Burlington, Vt.
F. G. Brownell, *M. M., M. C. B. & P. A.* do.
Burlington & Mo. Riv. R. R. (in Neb.) (*See C., B. & Q.*)
Burlington & North-West'n Ry. 3 g. 38 m. 3 lo. 85 c.
John T. Gerry, *Supt* .... Burlington, Ia.
Burlington & Ohio River R. R.
Gen. Man. & Pur. Agt. Chicago, Ill.
J. K. Lape, *Supt. of Equip* .... Chicago, Ill.

C

Camden & Atlantic R. R. 4-8½ g. 79 m. 16 lo. 264 c.
Supt & Pur. Agt .... Camden, N. J.
Rufus Hill, *M. M.* .... Camden, N. J.
Samuel Wills, *M. C. B.* .... Camden, N. J.
Canada Southern Ry. 4-8½ g. 403 m. 89 l. 3,367 c.
W. P. Taylor, *Gen. Man* .... Buffalo, N. Y.
A. F. Howland, *Pur. Agt* .... St. Thomas, Ont.
W. A. Short, *Gen. M. M.* .... St. Thomas, Ont.
Rob't Potts, *Gen. M. C. B.* .... St. Thomas, Ont.
Can. Div.: W. E. Carroll, *Supt.* .St. Thomas, Ont.
Robert Potts, *M. C. B.* .... St. Thomas, Ont.
U. S. Div.: E. P. Murray, *Supt.* .... Detroit, Mich.
O. P. Dunbar, *M. M.* .... Grosse Isle, Mich.
Canadian Pacific R. R. 4-8½ g. 551 m. 26 lo. 473 c.
W. C. Van Horne, *Gen. Man* .... Winnipeg, Man.
Eastern Div. 240 m. 16 lo. 276 cars.
Archer Baker, *Gen. Supt* .... Montreal, Can.
Tho. Irwin, *Mech. Supt* .... Brockville, Ont.
Western Div. 311 m. 10 lo. 207 cars.
A. B. Stickney, *Gen. Supt* .... Winnipeg, Man.
T. W. Shaughnessy, *Pur. Agt.* Winnipeg, Man.
F. C. Butterfield, *M. M. & M. C. B.* Winnipeg, Man.
Cape F'r & Yadkin Val. R. R. 4-8½ g. 47 m. 3 lo. 31 c.
L. C. Jones, *Gen. Supt* .... Fayetteville, N. C.
Isaac W. Clark, *M. M. & C. B.* .Fayetteville, N. C.
Carolina Central R. R. (*See Ral. & Aug.*)
Carson & Colorado R. R. (*See Va. & Truckee*).
Catasauqua & Fogelsville. 4-8½ g. 25 m. 6 lo. 577 c.
C. W. Chapman, *Supt. & P. A.* Catasauqua, Pa.
J. Thomas, *M. M.* .... Hokendauqua, Pa.
Chas. J. Holbach, *M. C. B.* .... Catasauqua, Pa.
Central and South-Western Railroads (Ga.).
5 g. 975 m. 127 lo. 1,858 cars.
W. G. Raoul, *V. P. and G. Man.* Savannah, Ga.
Wm. Rogers, *Gen. Supt* .... Savannah, Ga.
Henry Yonge, *Pur. Agt* .... Savannah, Ga.
Cen. Div.: D. D. Arden, *M. M.* .... Savannah, Ga.
John McCann, *M. M.* .... Augusta, Ga.
R. M. Barthlemess, *M. C. B.* .... Savannah, Ga.
So.-West'n Div.: W. F. Shellman, *Supt.* Macon, Ga.
D. M. Gugel, *M. M.* .... Macon, Ga.
James A. Knight, *M. C. B.* .... Macon, Ga.
Central R. R. of N. J. 4-8½ g. 544 m. 294 lo. 27,198 c.
W. W. Stearns, *Gen. Supt* .... Elizabeth, N. J.
B. W. Burnett, *Pur. Agt* .... New York, N. Y.
Cen Div.: W. Woodcock, *M. M.* Elizabethport, N. J.
Geo. Hackett, *M. C. B.* .... Elizabethport, N. J.
C. G. Williams, *M. M.* .... Jersey City, N. J.
John Alpaugh, *M. M.* .... Phillipsburg, N. J.
LongBr. Div.: J. F. Randolph, *Supt.* Long Branch, N.J.
N. J. So. Div.: R. Blodgett, *Supt* .. Manchester, N.J.
Wm. Montgomery, *M. M.* .... Manchester, N. J.
Chas. N. Sawyer, *M. C. B.* .... Manchester, N. J.
Lehigh & Susquehanna Div.:
W. S. Polhemus, *Supt* .... Mauch Chunk, Pa.
L. C. Brastow, *Supt. Mach* .... Ashley, Pa.
Central R. R. of S. C. (*See Wil. & Wel.*)
Central Iowa Ry. 4-8½ g. 354 m. 49 lo. 1,959 cars.
D. N. Pickering, *Gen. Supt* .. Marshalltown, Ia.
John Player, *M. M.* .... Marshalltown, Ia.
T. L. Seevers, *M. C. B.* .... Marshalltown, Ia.
Central Pac. R. R. 4-8½ g. 3,780 m. 269 lo. 7,277 c.
A. N. Towne, *Gen. Man* .... San Francisco, Cal.
J. A. Fillmore, *Gen. Supt* .. San Francisco, Cal.
R. H. Pratt, *A. G. Supt* .... San Francisco, Cal.
J. R. Watson, *Gen. Pur. Agt* .Sacramento, Cal.
A. J. Stevens, *Gen. M. M.* .... Sacramento, Cal.
W. McKenzie, *Asst. G. M. M.* .Sacramento, Cal.
Benj. Welch, *Gen. M. C. B.* .... Sacramento, Cal.
G. J. Turner, *Asst. G. M. C. B.* Sacramento, Cal.
Western: Visalia & Tulare Divs. and Northern Ry.
A. D. Wilder, *Supt* .... W. Oakland, Cal.
G. D. Welch, *M. M.* (W. Div.) W. Oakland, Cal.
W. B. Ludlow, *M. C. B.* (W. Div.) do.
S. Johnson, *M. M.* (T. Div.) .... Tulare, Cal.
D. Rutherford, *M. M.* (N. Rd.) S. Vallejo, Cal.
Sacramento; Oregon Divs.; and Cal. Pac. R. R.
J. B. Wright, *Supt* .... Sacramento, Cal.
M. W. Cooley, *M. M.* (S. Div.) Sacramento, Cal.
Truckee Div.: Frank Free, *Supt.* Wadsworth, Nev.
Geo. Gregg, *M. M.* .... Wadsworth, Nev.
Wm. McPherson, *F. Car Sh.* .Wadsworth, Nev.
Humb't Div.: G. W. Coddington, *Supt.* Carlin, Nev.
W. F. Smith, *M. M.* .... Carlin, Nev.
J. C. Doughty, *For. Car Sh.* .... Carlin, Nev.
Salt Lake Div.: A. G. Fell, *Supt.* .... Ogden, Utah.
James Lamb, *M. M.* .... Terrace, Utah.
A. Sherburne, *For. Car Sh.* .... Ogden, Utah.
Los Angeles; and Yuma Divs. (So. Pac.):
E. E. Hewitt, *Asst. Supt* .... Los Angeles, Cal.
James Velsir, *M. M.* .... Los Angeles, Cal.
T. T. Gilleland, *For. Car Sh.* Los Angeles, Cal.
Arizona Divs (So. Pac.):
A. A. Bean, *Asst. Supt* .... Tucson, Ariz.
W. F. Smith, *M. M.* .... Tucson, Ariz.
Rio Grande and El Paso Divs. (So. Pac.):
J. Campbell, *Ass't Supt* .... El Paso, Texas.
H. C. Standish, *For. Sh.* .... El Paso, Texas.
Central Vermont R. R. 4-8½ g. 548 m. 132 lo. 2,522 c.
J. W. Hobart, *Gen. Supt* .... St. Albans, Vt.
J. M. Foss, *Asst. Gen. Supt. & M. M.* St. Albans, Vt.
No. Div.: I. B. Futvoye, *Supt* .... St. Johns, P. Q.
Rut. Div.: J. Burdett, *Supt* .... Rutland, Vt.
N. L. Davis, *M. M. & C. B.* .... Rutland, Vt.
Brat. Div.: E. F. Brooks, *Supt.* .. Brattleboro, Vt.
New London & No'n R. R. 143 m. 22 lo. 303 c.
G. W. Bentley, *G. Supt. & P. A.* .. New London, Ct.
I. W. Dow, *M. M.* .... New London, Ct.
S. O. Banks, *M. C. B.* .... New London, Ct.

Charleston & Savannah Ry. 5 g. 115 m. 17 lo. 98 c.
H. S. Haines, *Gen. Man* .... Savannah, Ga.
C. S. Gadsden, *Gen. Supt* .... Charleston, S. C.
H. A. Ulmo, *M. M.* .... Savannah, Ga.
Charlotte, Columbia & Augusta R. R. (*See Rich. & D.*)
Chateaugay R. R. 3 g. 34 m. 6 lo. 125 cars.
A. L. Inman, *Gen. Man* .... Plattsburg, N. Y.
J. M. Davis, *Supt. & M. M.* .... Plattsburg, N. Y.
Chattaroi Ry. 4-8½ g. 43 miles 11 loco. 483 cars.
C. H. Rockwell, *Gen. Man. & P. A.* Ashland, Ky.
J. R. Martin, *M. M.* .... Ashland, Ky.
Joseph P. Burleigh, *M. C. B.* .... Ashland, Ky.
Cheraw & Chester R. R. 3 g. 30 m. 3 lo. 38 cars.
W. H. Harding, *Pres. & Supt* .... Chester, S. C.
A. M. Manning, *M. M.* .... Chester, S. C.
Cheraw & Darlington R. R. (*See Wil. & Wel.*)
Cheraw & Salisbury R. R. (*See Wil. & Wel.*)
John Postel, *Manager* .... Cedartown, Ga.
C. E. Scruton, *M. M. & C. B.* .... Cedartown, Ga.
Chesapeake, Ohio & So.-W'n 4-9 g. 398 m. 39 lo. 989 c.
R. Meek, *G. S. & Pur. Agt* .... Louisville, Ky.
F. H. Britton, *Mast. Trans* .... Paducah, Ky.
W. D. Robb, *S. M. P. & M.* .. Elizabethtown, Ky.
Geo. Dickey, *M. M.* .... Elizabethtown, Ky.
H. A. Wentzell, *M. M.* .... Paducah, Ky.
Chesapeake & Ohio Ry. 4-8½ g. 642 m. 133 l. 3,543 c.
C. W. Smith, *Gen. Man* .... Richmond, Va.
D. A. Sweet, *Asst. to Gen. Man.* Richmond, Va.
A. H. Wood, *Asst. Gen. Supt.*, Huntington, W. Va.
A. S. Emmons, *Pur. Agt* .... Richmond, Va.
John McFarland, *Supt. M. P.* .... Richmond, Va.
Eastern Div.: E. T. Smith, *Supt.* .Richmond, Va.
J. N. King, *M. C. B.* .... Richmond, Va.
Hunt. Div.: W. P. Harris, *Supt* .... Hinton, W. Va.
T. L. Chapman, *Asst. Supt. M. P.*, and
H. C. Bassinger, *M. C. B.* Huntington, W. Va.
Lex. Div.: J. D. Yarrington, *Supt.* Lexington, Ky.
Cheshire R. R. 4-8½ g. 80 m. 30 lo. 499 cars.
R. Stewart, *Gen. Man* .... Keene, N. H.
H. H. Stone, *Pur. Agt* .... Keene, N. H.
F. A. Perry, *M. M.* .... Keene, N. H.
A. E. Howard, *G. For. Car Sh.* .... Keene, N. H.
Chester & Lenoir Ry. 3 g. 50 m. 3 lo. 23 cars.
James Mason, *Supt* .... Yorkville, S. C.
T. P. Beard, *M. M.* .... Yorkville, S. C.
Chicago, B. & Kan. City Ry. 4-8½ g. 181 m. 9 lo. 130 c.
Robt. Law, *Gen. Supt* .... Keokuk, Ia.
W. H. Bartlett, *Act. M. M.* .... Burlington, Ia.
Chicago, Burlington & Quincy R. R.
4-8½ g. 2,924 m. 521 lo. 18,955 cars.
T. J. Potter, *Gen. Man* .... Chicago, Ill.
(1) C., B. & Q., East of Mo. Riv. 1,938 miles.
H. B. Stone, *Gen. Supt* .... Chicago, Ill.
Geo. C. Smith, *Pur. Agt* .... Chicago, Ill.
G. W. Rhodes, *Supt. M. P.* .... Aurora, Ill.
Wm. Forsyth, *Mech. Eng* .... Aurora, Ill.
Ill. Divs.: J. D. Besler, *Supt* .... Galesburg, Ill.
Chi. Div.: Geo. Alexander, *Supt* .... Aurora, Ill.
L. E. Johnson, *M. M.* .... Aurora, Ill.
Galesburg Div.: F. C. Rice, *Supt.* Galesburg, Ill.
Robert Colville, *M. M.* .... Galesburg, Ill.
St. L. Div.: S. E. Crance, *Supt* .... St. Louis, Mo.
A. Forsyth, *M. M.* .... Beardstown, Ill.
Ia. & Mo. Divs.: *Supt.* .Burlington, Ia.
East. Div.: O. E. Stewart, *Supt.* .Burlington, Ia.
Joel West, *M. M.* .... Burlington, Ia.
Mid. Div.: J. B. Maxon, *Supt* .... Ottumwa, Ia.
West'n Div.: W. B. Ryder, *Supt* .... Creston, Ia.
C. W. Eckerson, *M. M.* .... Creston, Ia.
(2) C., B. & Q., West of Mo. Riv. 935 miles.
G. W. Holdrege, *Gen. Supt* .... Omaha, Neb.
Jas. M. Barr, *Pur. Agt* .... Omaha, Neb.
D. Hawksworth, *Gen. M. M.* .. Plattsmouth, Neb.
Bur. & Mo. Riv. & Neb. Ry. Divs.:
D. E. Thompson, *Supt* .... Lincoln, Neb.
E. Bignal, *M. M.* .... Lincoln, Neb.
R. V. Div.: A. Campbell, *Supt* .... Hastings, Neb.
A. & N. Div.: J. McConniff, *Supt* .. Lincoln, Neb.
Chicago, Milwaukee & St. Paul R. R.
4-8½ g. 4,383 m. 425 lo. 13,659 cars.
S. S. Merrill, *Gen. Man* .... Milwaukee, Wis.
J. T. Clark, *Gen. Supt* .... Milwaukee, Wis.
J. T. Crocker, *Pur. Agt* .... Milwaukee, Wis.
J. M. Lowry, *Gen. M. M.* .... Milwaukee, Wis.
John Bailie, *Supt. Car Dept* .. Milwaukee, Wis.
(1) H. C. Atkins, *Asst. Gen. Supt* .Milwaukee, Wis.
Chi. Div.: S. J. Collins, *Supt* .... Chicago, Ill.
La Crosse Div: W. G. Collins, *Supt.* Milwaukee, Wis.
C. Bluffs Div.: A. J. Earling, *Supt* .... Marion, Ia.
P. du C. & M. Pt. Divs.:
R. B. Campbell, *Supt* .... Milwaukee, Wis.
(2) C. H. Prior, *Asst. Gen. Supt* .. Minneapolis, Minn.
H. & D. Div.: C. W. Case, *Supt.* Minneapolis, Minn.
J. O. Pattie, *M. M.* .... Minneapolis, Minn.
Ia. & Minn. Div.: H. R. Williams, *Supt.* do.
So. Minn. & River Divs.:
F. D. Underwood, *Supt* .... La Crosse, Wis.
Ia. & Da. Div.: G. W. Sanborn, *Supt.* Mason City, Ia.
S. Cy. & Da. Div.: J. Jackson, *Supt.* Sioux City, Ia.
F. H. Moulton, *M. M.* .... Yankton, Dak.
Dubuque Div.: J. H. Jenkins, *Supt.* .Dubuque, Ia.
S. Charnley, *M. M.* .... Dubuque, Ia.
(3) D. A. Olin, *Asst. Gen. Supt* .... Racine, Wis.
So.-Wn. Divs.: D. L. Bush, *Supt* .... Racine, Wis.
John Taylor, *M. M.* .... Racine, Wis.
E. A. Eddy, *M. C. B.* .... Racine, Wis.
Northern Div.: L. B. Rock, *Supt.* .Milwaukee, Wis.
Wm. E. Kittredge, *M. C. B.* .. Milwaukee, Wis.
Chicago, Pekin & So.-Wn. R. R. 4-8½ g. 88 m. 8 lo. 455 c.
A. H. Crocker, *Rec* .... Joliet, Ill.
J. N. Chilson, *M. C. B.* .... Streator, Ill.
Chicago, Rock Island & Pac. Ry.
4-8½ g. 1,381 m. 300 lo. 7,760 cars.
R. R. Cable, *V. P. & Gen. Man* .... Chicago, Ill.
A. Kimball, *Gen. Supt* .... Chicago, Ill.
F. A. Marsh, *Pur. Agt* .... Chicago, Ill.
T. B. Twombly, *Gen. M. M.* .... Chicago, Ill.
B. K. Verbryck, *Gen. M. C. B.* .... Chicago, Ill.
Ill. Div.: R. H. Chamberlin, *Supt* .... Chicago, Ill.
R. Biester, *M. M.* .... Chicago, Ill.
Sam'l Pullman, *M. C. B.* .... Chicago, Ill.
Ia. Div.: H. F. Royce, *Supt* .... Des Moines, Ia.
J. G. Crockett, *M. M.* .... Stuart, Ia.
Jas. E. Morrill, *M. M.* .... Davenport, Ia.
Chas. M. Leonard, *M. C. B.* .... Davenport, Ia.
So.-Wn. Div.: G. F. Walker, *Supt* .... Trenton, Ia.
R. O. Carscadin, *M. M.* .... Trenton, Ia.
Chas. R. Best, *M. C. B.* .... Trenton, Ia.
K. & Des. M. Div.: Jno. Given, *Supt* .. Keokuk, Ia.
S. W. Wakefield, *M. M.* .... Keokuk, Ia.
Henry Kummer, *M. C. B.* .... Keokuk, Ia.
Chi., Saginaw & Can. R. R. 4-8½ g. 38 m. 4 lo. 16 c.
J. A. Elwell, *Gen. Man. & Pur. Agt.* St. Louis, Mich.
Jas. T. Hall, *Supt* .... St. Louis, Mich.
Chicago, St. Louis & New Orleans R. R.
4-8½ g. 571 m. 101 lo. 1,913 cars.
J. C. Clarke, *V. P. & G. Man.* .New Orleans, La.
L. T. Brien, *Asst. Gen. Man.* .New Orleans, La.
C. M. Sheafe, *Gen. Supt* .... New Orleans, La.
H. B. Febiger, *Pur. Agt* .... New Orleans, La.
W. H. Purdy, *Supt. Mach.* .McComb City, Miss.
Geo. W. Baxter, *M. C. B.* .. McComb City, Miss.
So. Div.: E. D. Anderson, *Acting Supt.* do.
W. P. McKinley, *M. M.* .... McComb City, Miss.
No. Div.: J. G. Mann, *Supt* .... Jackson, Tenn.
J. M. Keith, *M. M.* .... Jackson, Tenn.
J. F. White, *M. M.* .... Water Valley, Miss.
Chicago, St. Paul, Minneapolis & Omaha Ry.
4-8½ g. 1,037 m. 131 lo. 4,688 cars.
C. F. Hatch, *Gen. Supt* .... St. Paul, Minn.
W. H. S. Wright, *Pur. Agt* .... St. Paul, Minn.
Matt. Ellis, *M. M.* .... St. Paul, Minn.
W. B. Rice, *M. C. B.* .... St. Paul, Minn.
Ea. & No. Div.: A. A. Hobart, *Supt.* St. Paul, Minn.
St. Paul Div.: J. F. Lincoln, *Supt.* St. Paul, Minn.
Sioux City Div.: H. Spencer, *Supt.* Sioux City, Ia.
F. W. Heintselman, *Gen. For. Sh.* Sioux Cy, Ia.
Neb. Div.: G. V. Morford, *Supt* .... Omaha, Neb.
Chicago, Texas & Mexican Central Ry.
4-8½ g. 52 m. 4 lo. 60 cars.
Gen. Supt .... Dallas, Tex.
Chas. Howard, *Pur. Agt* .... Chicago, Ill.
Chicago & Alton R. R. 4-8½ g. 840 m. 213 lo. 6,148 c.
J. C. McMullin, *Gen. Man* .... Chicago, Ill.
C. H. Chappell, *Act. Gen. Man* .... Chicago, Ill.
W. F. Merrill, *Gen. Supt* .... Chicago, Ill.
A. V. Hartwell, *Pur. Agt* .... Chicago, Ill.
Wm. Wilson, *Supt. of Mach* .... Bloomington, Ill.
Jos. Townsend, *G. For. Car Dept.* do.

Chi. Div.: A. M. Richards, *Supt.* .Bloomington, Ill.
St. Louis Div.: T. M. Bates, *Supt.* .Roodhouse, Ill.
Kan. Cy. Div.: O. Vaughan, *Supt* .... Slater, Mo.
Wm. McPhail, *M. M.* .... Slater, Mo.
Chi. & East'n Ill. 4-8½ g. 248 m. 56 lo. 3,500 cars.
O. S. Lyford, *Gen. Supt* .... Chicago, Ill.
D. R. Patterson, *Pur. Agt* .... Chicago, Ill.
P. W. Drew, *M. Trans* .... Chicago, Ill.
Allen Cooke, *M. M.* .... Danville, Ill.
Chicago & Grand Trunk Ry. (*See Grand Trunk.*)
Chicago & Iowa R. R. 4-8½ g. 104 m. 16 lo. 237 cars.
T. J. Potter, *Gen. Man* .... Chicago, Ill.
W. H. Holcomb, *Gen. Supt* .... Rochelle, Ill.
H. S. Bryan, *M. M.* .... Aurora, Ill.
Chicago & Northwestern Ry.
4-8½ g. 3,476 m. 558 lo. 18,685 cars.
Marvin Hughitt, *2d V. Prs. & G. M.* Chicago, Ill.
J. D. Layng, *Gen. Supt* .... Chicago, Ill.
R. W. Hamer, *Pur. Agt* .... Chicago, Ill.
Geo. W. Tilton, *Supt. M. P. & M.*; and
J. M. Boon, *A. Supt. M. P. & M.* .Chicago, Ill.
Wis. and Mil. Divs. & Sheboygan & W'n Ry.:
Chas. D. Gorham, *Supt* .... Chicago, Ill.
Gal. Div.: Chas. Murray, *Supt* .... Chicago, Ill.
Pen'r Div.: W. B. Linsley, *Supt.* .Escanaba, Mich.
Geo. H. White, *M. M.* .... Escanaba, Mich.
Mad. Div.: C. A. Swineford, *Supt.* .Baraboo, Wis.
Win. & St. P. Div.: S. Sanborn, *Supt.* Winona, Minn.
W. A. Scott, *M. M.* .... Winona, Minn.
Dak. Cen. Ry.: T. J. Nicholl, *Supt* .... Huron, Dak.
Ia. Div.: J. M. Whitman, *Supt* .... Clinton, Ia.
Geo. W. Lowe, *M. M. & M. C. B.* Clinton, Ia.
No. Ia. Div.: H. G. Burt, *Supt* .... Eagle Grove, Ia.
Chicago & West Michigan:
4-8½ g. 409 m. 43 lo. 1,345 cars.
Geo. C. Kimball, *V. P. & G. Man.* Muskegon, Mich.
C. Harris, *Gen. Supt* .... Muskegon, Mich.
H. Park, *Pur. Agt* .... Muskegon, Mich.
W. F. N. Davis, *M. M.* .... Muskegon, Mich.
Cincinnati, Columbus & Hocking Val. Ry.
4-9 g. 25 m. 1 lo. 27 cars.
J. E. Gimperling, *Gen. Man* .... Dayton, O.
Geo. F. Robinson, *Supt* .... Washington, O.
Cin., Georgetown & Portsmouth. 3 g. 35 m. 2 lo. 39 c.
M. Simmons, *Supt* .... Cincinnati, O.
J. C. Homer, *M. M.* .... Cincinnati, O.
Cincinnati, Green Riv. & Nashville R. R. 3 g.
A. C. Sim, *Supt* .... King's Mountain, Ky.
G. Brashears, *Pur. Agt* .... Cincinnati, O.
Cincinnati, Hamilton & Dayton R. R.
Geo. S. Griscom, *Gen. Supt* .... Cincinnati, O.
John Black, *Gen. M. M.* .... Lima, O.
W. H. H. Allison, *M. C. B.* .... Cincinnati, O.
C. R. & C. Div.: W. S. Brewer, *M. M.* Richm'd, Ind.
Cincinnati, Indianapolis, St. Louis & Chicago Ry.
4-8½ g. 370 m. 71 lo. 3,279 cars.
J. W. Sherwood, *Supt* .... Indianapolis, Ind.
Geo. Tozzer, *Pur. Agt* .... Cincinnati, O.
J. S. Patterson, *M. of Mach. & M. C. B.* Cincinn., O.
Cincinnati, New Orleans & Texas Pacific Ry. Co.
5 g. 841 m. 123 lo. 2,687 cars.
John Scott, *V. Pres. & Gen. Man.* .Cincinnati, O.
R. W. Healey, *Gen. Pur. Agt* .... Cincinnati, O.
James Meehan, *Gen. M. M.* .... Cincinnati, O.
Cin. So. Div.: R. Carroll, *Gen. Supt* .... Cin., O.
I. W. Fowle, *M. M.* .... Cincinnati, O.
John Richardson, *M. C. B.* .... Cincinnati, O.
A. Thomson, *M. M.* .... Chattanooga, Tenn.
Ala. Gr. S'n Div.: C. B. Wallace, *Gen. Supt.*, and
George Manuell, *M. M.* .... Chattanooga, Tenn.
Fred Morgan, *M. C. B.* .. Chattanooga, Tenn.
V. & M. Div.: E. F. Raworth, *G. S.* Vicksburg, Miss.
James B. Browne, *M. M.* .... Vicksburg, Miss.
V. S. & P. Div.: F. Y. Dabney, *Supt.* .Monroe, La.
W. Bell Smith, *M. M. & C. B.* .... Monroe, La.
Cincinnati Northern Ry. 3 g. 30 m. 4 lo. 60 c.
G. L. Barringer, *Gen. Man* .... Cincinnati, O.
T. J. Hamer, *M. M. & C. B.* .... Cincinnati, O.
Cincinnati, Selma & Mobile R.R. 5 g. 71 m. 6 lo. 135 c.
D. McLaren, *Supt* .... Selma, Ala.
H. L. Wright, *Pur. Agt* .... Selma, Ala.
J. M. Levis, *M. M.* .... Marion, Ala.
Cincinnati Southern Ry. (*See Cin., N. O. & Tex. Pac.*)
Cin., Wabash & Mich. Ry. 4-8½ g. 165 m. 13 lo. 290 c.
Norman Beckley, *Gen. Man. & P. A.* Elkhart, Ind.
O. W. Lamport, *Supt* .... Wabash, Ind.
S. B. Tinker, *M. M. & M. C. B.* .... Wabash, Ind.
Cincinnati & Eastern Ry. 3 g. 76 m. 4 lo. 66 cars.
P. W. Naughton, *M. M.* .... Cincinnati, O.
Clarksburg, Weston & Glenville R. R.
3 g. 26 m. 3 lo. 28 cars.
A. H. Kunst, *Pres. and Gen. Man.* Weston, W. Va.
Sam. A. Steel, *M. M.* .... Weston, W. Va.
F. Dillie, *M. C. B.* .... Nottingham, O.
Cleveland, Columbus, Cincinnati & Indiana and Indianapolis & St. Louis Rys. and Dayton & Union R. R. 4-8½ g. 780 m. 246 lo. 7,082 cars.
E. B. Thomas, *Gen. Man* .... Cleveland, O.
J. L. Yale, *Pur. Agt* .... Cleveland, O.
W. F. Turreff, *Gen. M. M.* .... Cleveland, O.
Robt. Wiggins, *Gen. For* .... Delaware, O.
Col. & Cin. Div.: Robt. Blee, *Supt* .Cleveland, O.
W. L. Gilmore, *M. M.* .... Cleveland, O.
A. G. Steinbrenner, *G. For. Car Dept.* do.
Ind'p'lis Div.: Tho. Burrows, *Supt.* .Ind'polis, Ind.
J. K. Lape, *M. M.* .... Brightwood, Ind.
N. Mark, *G. For. Car Dept.* Brightwood, Ind.
Ind. & St. L. Ry.: Tho. Burrows, *Supt.* St. Louis, Mo.
T. W. Ranson, *M. M. & C. B.* .... Mattoon, Ill.
Day. & Un. Rd.: J. H. Barrett, *Supt.* Cincinnati, O.
H. S. Gordon, *M. M.* .... Dayton, O.
Cleveland, Mt. Vernon & Delaware R. R.
4-9 g. 144 m. 22 lo. 751 c.
N. Monsarrat, *Gen. Supt* .... Akron, O.
G. M. Taylor, *M. M. & C. B.* .... Mt. Vernon, O.
Cleve., Youngstown & Pitts. R. R. 3 g. 30 m. 3 lo. 112 c.
W. E. Lewis, *Gen. Supt* .... Alliance, O.
C. H. Dorman, *M. M. & M. C. B.* .... Alliance, O.
Cleveland, Tuscarawas Valley & Wheeling Ry.
4-8½ g. 158 m. 23 lo. 1,522 cars.
Oscar Townsend, *Gen. Man* .... Cleveland, O.
Wm. Thornburg, *Supt* .... Lorain, O.
Cleve. & Marietta R. R. 4-8½ g. 99 m. 9 lo. 157 cars.
S. C. Baldwin, *Gen. Man* .... Marietta, O.
M. D. Woodford, *Gen. Supt* .... Marietta, O.
R. B. Hoover, *Pur. Agt* .... Marietta, O.
Lewis James, *M. M.* .... Toledo, O.
Cleveland & Pittsburg R. R. (*See Penna. Co.*)
Coburg, Peterborough & Marmora Ry.
5-6 g. 47 m. 5 lo. 207 cars.
Jas. R. Barber, *Gen. Supt* .... Cobourg, Ont.
Jas. Clark, *M. M.* .... Cobourg, Ont.
John Tinney, *M. C. B.* .... Cobourg, Ont.
Columbia & Greenville R. R. (*See Rich. & Dan.*)
Columbus, Hocking Valley & Toledo Ry.
4-9 g. 319 m. 90 lo. 7,257 cars.
M. M. Greene, *Gen. Man* .... Columbus, O.
G. R. Carr, *Gen. Supt* .... Columbus, O.
W. M. Greene, *Pur. Agt* .... Columbus, O.
Ira G. Hutchins, *M. M.* .... Columbus, O.
J. M. Rockafield, *M. C. B.* .... Columbus, O.
Tol. Div.: M. T. Seymour, *Supt* .... Columbus, O.
Hock. V. Div.: M. P. L. Booth, *Supt.* Columbus, O.
Ohio Riv. Div.: C. D. Norris, *Supt* .... Logan, O.
Columbus & Maysville Ry. (*See Cin. & East.*)
Columbus & Rome R. R. 3 g. 33 m. 2 lo. 25 cars.
M. E. Gray, *Supt* .... Columbus, Ga.
Columbus & Western Ry. 5 g. 89 m. 2 lo. 19 cars.
E. A. Llewellen, *Gen. Man* .... Columbus, Ga.
R. A. Bridges, *M. M.* .... Opelika, Ala.
Concord & Claremont R. R. (*See Northern of N. H.*)
Conn. Riv. and Ver. Val. R. Rs. 4-8½ g. 130 m. 33 lo. 456 c.
J. Mulligan, *Supt. & Pur. Agt.* Springfield, Mass.
W. H. Stearns, *M. M.* .... Springfield, Mass.
Robert Hitchcock, *M. C. B.* .. Springfield, Mass.
Connotton Valley R. R. 3 g. 160 m. 26 lo. 896 cars.
Samuel Briggs, *Gen. Man* .... Canton, O.
B. C. Bosworth, *M. M.* .... Canton, O.
Cornwall R. R. 4-8½ g. 9 m. 5 lo. 166 cars.
Frank Donahue, *G. Supt. & M. M.* Lebanon, Pa.
Levi Bloneh, *M. C. B.* .... Lebanon, Pa.
Credit Valley Ry. 4-8½ g. 184 m. 22 lo. 535 cars.
James Ross, *Gen. Supt* .... Toronto, Ont.
John Macnab, *Pur. Agt* .... Toronto, Can.
H. G. Taylor, *Mech. Supt* .... Toronto, Can.
Crown Point Iron Co. R. R. 3 g. 13 m.
A. L. Inman, *Gen. Man* .... Plattsburg, N. Y.
J. M. Davies, *Supt. & M. M.* .Crown Point, N. Y.
J. C. Sherman, *M. C. B.* .... Crown Point, N. Y.

Cumberland Valley R. R. 4-9 g. 125 m. 21 lo. 430 cars.
J. F. Boyd, *Supt*......Chambersburg, Pa.
A. S. Hull, *M. M*......Chambersburg, Pa.
C. Wickey, *F. C. R*......Chambersburg, Pa.
Cumberland & Penn. R. R. 4-8½ g. 55 m. 28 lo. 625 c.
P. L. Burwell, *Gen Supt & P A*.Cumberland, Md.
N. W. Howson, *Mast. of Mach*.Mt. Savage, Md.
Nathan Binix, *M. C. B*......Mt. Savage, Md.

D

Danbury & Norwalk R. R. 4-8½ g. 33 m. 6 lo. 100 c.
L. W. Sandiforth, *G. Supt. & P. A*..S. Norwalk, Ct.
N. M. George, *M. M. & C. B*....Danbury, Conn.
Danville, Mocksville & So.-Wn. R. R. 3 g. 28 m.
H. W. Goodrich, *Ch. Eng*.....Leakesville, N. C.
Danville, Olney & O. R. R.R. 4-8½ g. 110 m. 4 lo. 83 c.
Jas. R. Maxwell, *G. Man. & P. A*....Olney, Ill.
J. M. Graham, *Supt*......Kansas, Ill.
Louis Parisoe, *M. M & C. B*......Kansas, Ill.
Dayton & Union R. R. (*See Ohio Ry.*)
Del., Lackawanna & W. and N. Y., Lack. & W. R. Rs.
4-8½ g. 670 m. 348 lo. 26,187 cars.
Wm. F. Halstead, *Gen. Supt*.....Scranton, Pa.
G. W. B. Cushing, *Pur. Agt*...New York, N. Y
Walter Dawson, *Mast. of Mach*...Scranton, Pa.
Robt. McKenna, *M. C. B*......Scranton, Pa.
Bloomsb'g Div.: C. Graham, *M. M*..Kingston, Pa.
Utica Div.: A. C. Salisbury, *Supt*....Utica, N. Y.
Thos. Thatcher, *M. M*......Utica, N. Y.
Morris & Essex Div.; Sussex; P. & D. and C. R. Rs.
A. Reasoner, *Supt*......Hoboken, N. J.
W. H. Lewis, *M. M*......Kingsland, N. J.
J. W. Baker, *Mast. Car Rep*.....Dover, N. J.
Oswego & Syracuse Div.:
W. B. Phelps, *Supt*......Oswego, N. Y.
Jas. Buchanan, *M. M*......Syracuse, N. Y.
Syracuse, Binghamton & New York R. R.
4-8½ g. 81 m. 20 lo. 598 cars.
W. K. Niver, *Gen. Supt*.....Syracuse, N. Y.
Jas. Buchanan, *M. M*......Syracuse, N. Y.
Delaware Western R. R. 4-8½ g. 20 m. 4 lo. 35 cars.
David Connell, *Supt*......Wilmington, Del.
Delaware & Chesapeake R. R. 4-8½ g. 54 m. 3 lo. 16 c.
O. S. Sanford, *Supt*......Oxford, Md.
Joseph A. Baynard, *M. M*......Oxford, Md.
Chas. E. Mason, *M. C. B*......Oxford, Md.
Delaware & Hudson Canal Co.
4-3 and 4-8½ g. 596 m. 151 lo. 9,248 cars.
C. F. Young, *Gen. Man*......Honesdale, Pa.
C. F. Young, *Pur. Agt*......Albany, N. Y.
R. C. Blackall, *Supt. of Mach*.....Albany, N. Y.
Susq. Div.: C. D. Hammond, *Supt*. Albany, N. Y..
C. A. Jones, *M. M*......Oneonta, N. Y.
J. R. Skinner, *M. C. B*......Oneonta, N. Y.
Sar. & Ch. Divs.: T. Voorhees, *Supt*...Troy, N. Y.
J. L. Corey, *M. M*......Green Island, N. Y.
Chr. Körner, *M. C. B*.....Green Island, N. Y.
Pa. Div.: R. Manville, *Supt & Pur Agt*. and
S. H. Dotterer, *M. M*......Carbondale, Pa.
T. Orchard, *M. C. B*......Carbondale, Pa.
Denver & New Orleans. 4-8½ g. 140 m. 11 lo. 400 c.
C. W. Fisher, *Gen. Man*......Denver, Col.
Chas. Wheeler, *Pur. Agt*......Denver, Col.
S. P. Weller, *M. M. & M. C. B*.....Denver, Col.
Denver & Rio Grande Ry. 3 g. 1,062 m. 170 lo. 4,617 c.
D. C. Dodge, *Gen. Man*......Denver, Col.
Henry Wood, *Gen. Supt*..Salt Lake City, Utah.
Geo. W. Ristin, *Asst. Gen. Man*...Denver, Col.
A. B. Garner, *Pur. Agt*......Denver, Col.
N. W. Sample, *M. M*......Denver, Col.
M. C. B......Burnham, Col.
1st Div.: W. H. Bancroft, *Supt*....S. Pueblo, Col.
2d Div.: R. M. Ridgway, *Supt*.....Alamosa, Col.
3d Div.: Cole Lydon, *Supt*......Leadville, Col.
4th Div.: J. A. Myers, *Supt*......Salida, Col.
Des Moines & Ft. Dodge. 4-8½ g. 143 m. 13 lo. 232 c.
C. N. Gilmore, *Supt*......Des Moines, Ia.
John McGrayel, *M. M*......Grand Junction, Ia.
E. A. Avery, *M. C. B*......Grand Junction, Ia.
Det., Gr. H. & Mil. Ry. 4-8½ g. 189 m. 36 lo. 478 c.
G. R. Nash, *Gen. Man*......Detroit, Mich.
John S. Lorimer, *Storekeeper*....Detroit, Mich.
W. J. Morgan, *Supt*......Detroit, Mich.
F. Parker, *Mech. Supt*......Detroit, Mich.
Det., Lansing & No'n R. R. 4-8½ g. 222 m. 84 lo. 1027 c
John B. Mulliken, *Gen. Man*......Detroit, Mich.
Allan Bourn, *Pur. Agt*......Detroit, Mich.
Thos. M. Fish, *Gen. Supt*......Ionia, Mich.
G. C. Watrous, *M. M. & C. B*......Ionia, Mich.
Det., Mack. & Marq. R. R. 4-8½ g. 151 m. 16 lo. 1112 c.
D. McCool, *Gen. Supt*......Marquette, Mich.
E. W. Allen, *Pur. Agt*......Marquette, Mich.
John Wilson, *Mech. Supt*......Marquette, Mich.
Dorchester & Delaware R. R. 4-8½ g. 33 m.
Thos. E. Wright, *Supt*......Cambridge, Md.
Dubuque & Dakota R. R. 4-8½ g. 64 m. 2 lo. 54 cars.
A. C. Goodrich, *Supt*......Waverly, Ia.
W. S. Couch, *Pur. Agt*......Dubuque, Ia.
Duck River Valley R. R. 3 g. 34 m.
Geo. Childress, *Supt*......Columbia, Tenn.
Dunkirk, Allegheny Valley & Pittsburgh R. R.
4-8½ g. 91 m. 14 lo. 102 cars.
D. Thayer, *Gen. Supt*......Dunkirk, N. Y.
R. C. Moore, *Pur. Agt*......New York, N. Y.
J. C. Haggett *M. M. & C. B*.....Dunkirk, N. Y.

E

East Broad Top R. R. 3 g. 30 m. 6 lo. 191 cars.
A. W. Sims, *Supt*......Orbisonia, Pa.
A. B. Greenwood, *M. M*......Orbisonia, Pa.
East Tennessee, Virginia & Georgia R. R.
5 g. 1,185 m. 133 lo. 1,597 cars.
Henry Fink, *V. P. & Gen. Man*.Lynchburg, Va.
J. F. O'Brien, *Gen. Supt*......Knoxville, Tenn.
East Tenn. Div. and No. Car. and Ohio Branches:
F. K. Huger, *Supt*......Knoxville, Tenn.
B. J. Sitton, *M. M*......Knoxville, Tenn.
Jos. Armbruster, *M. C. B*....Knoxville, Tenn.
Alabama Div.: J. M. Bridges, *Supt*...Selma, Ala.
Simon Gay, *M. M*......Selma, Ala.
W. W. Pierce, *M. C. B*......Selma, Ala.
Memphis & Charleston R. R. (Div.):
R. B. Pegram, Jr., *Supt*.....Memphis, Tenn.
H. N. Burford, *M. M*......Memphis, Tenn.
Macon & Brunswick Div.:
J. F. Mallory, *Supt*......Macon, Ga.
C. H. Beale, *M. M*......Macon, Ga.
Ga. Div.: W. V. McCracken, *Supt*.....Atlanta, Ga.
East & West R. R. of Alabama.
John Postell, *Manager*......Cross Plain, Ala.
Eastern R. R. 4-8½ g. 283 m. 99 lo. 2,268 cars.
Payson Tucker, *Gen. Man*......Boston, Mass.
D. W. Sanborn, *Mast. of Trans*..Boston, Mass.
G. F. Hurd, *Pur. Agt*......Boston, Mass.
Amos Pillsbury, *S. M. P. & M*...E. Boston, Mass.
J. D. Billings, *G. For. Car Dept*...Salem, Mass.
Con'y Div.: J. W. Sanborn, *Supt*., Wolfboro J., N. H.
Eastern Kentucky R. R. 4-8½ g. 34 m. 5 lo. 123 c.
H. W. Bates, *Man. & Pur. Agt*...Riverton, Ky.
D. S. Weaver, *M. M*......Riverton, Ky.
Eastern Shore R. R. 4-8½ g. 38 m. 2 lo.
W. Thompson, *Supt*......Princess Anne, Md.
F. Strattner, *M. M*......Princess Anne, Md.
Elberton Air-Line R. R. (*See Rich. & Dan. N. G. Brs.*)
Elizabeth City & Norfolk R. R. 4-8½ g. 79 m. 5 lo. 96 c.
M. K. King, *Gen. Man. & Pur. Agt*.Norfolk, Va.
J. S. Whitworth, *M. M. & C. B*....Norfolk, Va.
Erie & Pittsburgh R. R. (*See Penna. Co.*)
Eureka & Palisade R. R. 3 g. 97 m. 7 lo. 124 cars.
P. Everts, *Gen. Supt & Pur. Agt*..Eureka, Nev.
E. C. Mills, *M. M*......Palisade, Nev.
A. S. Longley, *M. C. B*......Palisade, Nev.
Europ. & No. Amer. Ry. 4-8½ g. 114 m. 15 lo. 557 c.
F. W. Cram, *Supt. & Pur. Agt*....Bangor, Me.
A. O. Bailey, *M. M. & C. B*.Mattawamkeag, Me.
Evansville, Paducah & Cairo Line. 200 miles.
G. J. Grammer, *Supt*......Evansville, Ind.
Evansville, Rockport & E'n Ry. 4-9 g. 71 m. 5 lo. 98 c.
H. L. Shepard, *Supt*......Evansville, Ind.
Evansv. & Terre Haute. 4-8½ g. 145 m. 26 lo. 900 c.
C. J. Hepburn, *Gen. Supt*......Evansville, Ind.
John Torrance, *Gen. For*......Evansville, Ind.

F

Fitchburg R. R., 4-8½ g. 189 m. 100 lo. 3,315 cars.
John Adams, *Gen. Supt*......Boston, Mass.
E. K. Turner, *Asst. Supt*.....Fitchburg, Mass.
F. S. Pratt, *Pur. Agt*......Boston, Mass.
G. A. Coolidge, *Supt. M. P*......Boston, Mass.
W. A. Foster, *Asst. Supt. M. P*..Fitchburg, Mass.
J. W. Marden, *M. C. B*.....Charlestown, Mass.

Flint & Pere Marq. 4-8½ g. 345 m. 68 lo. 1,854 cars.
H. C. Potter, *Gen. Man*.....E. Saginaw, Mich.
D. Edwards, *Asst. Gen. Man*., E. Saginaw, Mich.
G. G. Cook, *Pur. Agt*......E. Saginaw, Mich.
Sanford Keeler, *Gen. Supt*..E. Saginaw, Mich.
W. F. Potter, *Supt*. (E. Div.)..E. Saginaw, Mich.
M. V. Meredith, *Supt*. (W. Div.)E. Saginaw, Mich.
T. J. Hatswell, *M. M*......E. Saginaw, Mich.
R. McPherson, *M. C. B*......E. Saginaw, Mich.
Florida Central & Western R. R.
5 g. 234 m. 16 lo. 160 cars.
Wm. M. Davidson, *Gen. Man*.Jacksonville, Fla.
Jas. S. McElroy, *Supt*......Tallahassee, Fla.
Florida Southern Ry. 3 g. 91 m. 6 lo. 96 cars.
H. S. Ming, *Gen. Supt*......Palatka, Fla.
M. R. Miller, *M. M. & C. B*....Palatka, Fla.
Florida Transit R. R. 5 g. 224 m.
D. E. Maxwell, *Gen. Supt*....Fernandina, Fla.
John Hedges, *Pur. Agt*......Fernandina, Fla.
R. V. Dahoney, *M. M*......Fernandina, Fla.
G. Hernandez, *M. C. B*.....Fernandina, Fla.
Fonda, Johnst'n & Gloversv. 4-8½ g. 26 m. 5 lo. 18 c.
Lawton Caten, *Supt*......Gloversville, N. Y.
Fond du Lac, Amboy & Peoria. 3 g. 30 m. 2 lo. 35 c.
Alonzo Kinyon, *Supt. & P. A*.Fond du Lac, Wis.
Fort Dodge & Fort Ridley R. R. 4-8½ g.
G. R. Pearson, *Supt*......Fort Dodge, Ia.
Ft. Madison & No.-West'n Ry. 3 g. 41 m. 4 lo. 120 c.
S. B. Kenrick, *Supt. & Pur. Agt*.Ft. Madison, Ia.
L. Lamb, *M. M. & C. B*......Ft. Madison, Ia.
Ft. Wayne, Cin. & Louisv. 4-8½ g. 108 m. 9 lo. 249 c.
White Water R. R. 4-8½ g. 62 m. 5 lo. 170 cars.
W. W. Worthington, *Gen. Supt*...Ft. Wayne, Ind.
T. H. Haberkorn, *M. M*......Ft. Wayne, Ind.
Wm. Knight, *M. C. B*......Ft. Wayne, Ind.
C. W. Hollister *M. M. & C. B*...Jackson, Mich.
Fulton County N. G. Ry. 3 g. 61 m. 3 lo. 106 cars.
A. C. Atherton, *Gen. Supt. & P. Agt*.Lewiston, Ill.

G

Galveston, Harrisburg & San Antonio Ry.
4-8½ g. 492 m. 47 lo. 1870 cars.
Jas. Converse, *Gen. Supt*......Houston, Tex.
Chas. Babbidge, *Pur. Agt*......Boston, Mass.
D. T. Davis, *Supt. M. P. & M*..Harrisburg, Tex.
James Alexander, *M. C. B*...Harrisburg, Tex.
El Paso Div. (*See Cen. Pac.*) 4-8½ g. 144 miles.
Galveston, Houston & Henderson R. R.
4-8½ g. 50 m. 17 lo. 212 cars.
W. H. Harding, *G. Man. & P. Agt*.Galveston, Tex.
Allen McCoy, *Supt*......Galveston, Tex.
J. G. Conlon, *M. M*......Galveston, Tex.
Geneva, Ithaca & Sayre R. R. (*See Lehigh Val.*)
Georgia R. R. 5 g. 307 m. 42 lo. 938 cars.
John W. Green, *Gen. Man*......Augusta, Ga.
John S. Cook, *M. M*......Augusta, Ga.
T. M. Preval, *M. C. B*......Augusta, Ga.
Georgia Pacific Ry. (Miss. Div.). 3 g. 43 m. 2 lo. 44 c.
C. M. Bolton, *Supt*......Greenville, Miss.
W. M. Sutton, *Pur. Agt*......Greenville, Miss.
Benj. Davis, *M. M*......Greenville, Miss.
J. B. Shelton, *M. C. B*......Greenville, Miss.
Grand Haven R. R. (*See Chic. & W. Mich.*)
Grand Junction R'y. (*See Midland of Can.*)
G'd Rap., Newaygo & L. S. R. R. (*See Chic. & W. M.*)
Grand Rapids & Indiana. 4-8½ g. 456 m. 52 lo. 1,566 c.
W. O. Hughart, *Gen. Man*.Grand Rapids, Mich.
W. R. Shelby, *Pur. Agt*....Grand Rapids, Mich.
S. D. Bradley, *M. M*......Grand Rapids, Mich.
No'n Div.: J. M. Metheany, *Supt*.G'nd Rap., Mich.
So'n Div.: P. S. O'Rourke, *Supt*.Fort Wayne, Ind.
Grand Tower & Carbondale. 4-8½ g. 25 m. 6 lo. 357 c.
T. M. Williamson, *Supt. & P. A*..Gr. Tower, Ill.
Hugh Smith, *M. M. & C. B*....Grand Tower, Ill.
Grand Trunk Ry. 4-8½ g. 1,267 m. 434 lo. 9,403 c.
Joseph Hickson, *Gen. Man*......Montreal, Can.
Wm. Wainright, *Asst. Man*......Montreal, Can.
Gr. Tr. Divs.: W. J. Spicer, *Supt*.Montreal, Can.
Jno. Taylor, *Gen. Storekeeper*.Montreal, Can.
Herbert Wallis, *Mech. Supt*...Montreal, Can.
Wm. McWood, *Supt. Car Dept*.Montreal, Can.
F. R. F. Brown, *Man. Lo. Wks*.Montreal, Can.
J. Haskoul, *Div. M. S*......Richmond, P. Q.
F. L. Wanklyn, *Div. M. S*...Brockville, Ont.
J. Davis Barnett, *Div. M. S*....Stratford, Ont.
Chi. & Gr. Trunk Ry. 4-8½ g. 330 m. 56 lo. 1,191 c.
S. R. Callaway, *Gen. Man*......Chicago, Ill.
W. H. Pettibone, *Supt*...Battle Creek, Mich.
A. Judd, *Pur. Agt*......Fort Gratiot, Mich.
H. Roberts, *Asst. M. S*.....Port Huron, Mich.
Great West'n Div.: 4-8½ g. 823 m. 216 lo. 5,039 c.
Chas. Stiff, *Supt*......Hamilton, Ont.
E. R. Baines, *Pur. Agt*......Hamilton, Ont.
C. K. Domville, *Loco. Supt*....Hamilton, Ont.
C. F. Hanson, *M. M*......London, Ont.
J. D. McIlwain, *G. F. C. D*......London, Ont.
Henry Childs, *Car Supt*......London, Ont.
Green Bay, Winona & St. Paul R. R.
4-8½ g. 250 m. 19 lo. 599 cars.
Timothy Case, *Gen. Man. & P. A*.Green Bay, Wis.
A. Fenwick, *M. M*......Ft. Howard, Wis.
Gulf, Col. & Santa Fé Ry. 4-8½ g. 482 m. 42 lo. 1,237 c.
John Sealy, *Gen. Man*......Galveston, Texas.
F. P. Killeen, *Asst. Gen. Man*.Galveston, Texas.
Jno. W. Thorne, *Pur. Agt*....Galveston, Texas.
G. B. Nichols, *M. M*......Galveston, Texas.
W. H. Martin, *M. C. B*......Galveston, Texas.
Gulf, W'n Texas & Pac. Ry. 4-8½ g. 68 m. 6 lo. 70 c.
M. D. Monserrate, *Pr. & Supt*....Cuero, Texas.
James Mooney, *M. M*......Cuero, Texas.

H

Halifax & Cape Breton Ry. 4-8½ g. 79 m. 9 lo. 208 c.
H. Abbott, *Manager*......New Glasgow, N. S.
Hannibal & St. Jo. R. R. 4-8½ g. 292 m. 76 lo. 1,860 c.
John B. Carson, *Gen. Man*......Hannibal, Mo.
W. R. Woodard, *Supt*......Hannibal, Mo.
T. L. Dunn, *Ch. Eng. & Pur. Agt*.Hannibal, Mo.
Jas. Long, *Supt. M. P. & Car Dep*.Hannibal, Mo.
Hanover Junction, Hanover & Gettysburg R. R.
4-8½ g. 74 m. 9 lo. 106 cars.
H. D. Scott, *Gen. Supt*......Hanover, Pa.
John J. Bingley *M. M*......Hanover, Pa.
Henry Britcher, *M. C. B*......Hanover, Pa.
Harrisburg & Potomac R. R. 4-8½ g. 35 m. 3 lo. 34 c.
R. H. Middleton, *Supt*......Boiling Springs, Pa.
Hartford & Conn. Val. R. R. 4-8½ g. 45 m. 9 lo. 196 c.
Samuel Babcock, *Pr. & Gen. Man*.Hartford, Ct.
Levi Woodhouse, *Asst. Supt*....Hartford, Ct.
S. E. Brewer, *M. M. & C. B*.....Hartford, Conn.
Hartford & Conn. W'n R. R. 4-8½ g. 110 m. 16 lo. 495 c.
John F. Jones, *Supt*......Hartford, Ct.
J. C. Barton, *M. M*......Hartford, Ct.
Housatonic R. R. 4-8½ g. 126 m. 22 lo. 495 cars.
W. H. Yeomans, *Supt*......Bridgeport, Ct.
D. S. Draper, *Pur. Agt*......Bridgeport, Ct.
N. Slingland, *M. M*......Falls Village, Ct.
J. J. Ferris, *M. C. B*......Falls Village, Ct.
Houston Belt Ry. 4-8½ and 3 gauge 50 miles.
S. L. Werden, *V. P. & Gen. Man*.Houston, Tex.
Houston, East & West Tex. Ry. 3 g. 120 m. 10 lo. 478 c.
Paul Bremond, *Pr. & Pur. Agt*..Houston, Tex.
E. L. Bremond, *Gen. Man*......Houston, Tex.
B. O. Diffey, *M. M*......Houston, Tex.
C. F. Schelewa, *M. C. B*......Houston, Texas.
Houston & Tex. Cen. Ry. 4-8½ g. 750 m. 78 lo. 2,526 c.
G. Jordan, *V. Pr. & Gen. Man*....Houston, Tex.
A. H. Swanson, *Gen. Supt*......Houston, Tex.
E. S. Larchar, *Pur. Agt*......New York, N. Y.
L. C. Noble, *Gen. M. M*......Houston, Tex.
James McGee, *M. C. B*......Houston, Tex.
So. & Wn. Divs.: M. G. Howe, *Supt*.Houston, Tex.
No. & Ml. Divs.: G. A. Quinlan, *Supt*.Dallas, Tex.
C. H. Burns, *Asst. M. M*......Corsicana, Tex.
No.-Wn. Div.: Donald Allen, *Supt*....Waco, Tex.
Humeston & Shenandoah R. R.
4-8½ g. 85 m. 5 lo. 72 cars.
F. O. Wyatt, *Gen. Man*......Clarinda, Ia.
M. B. Snyder, *M. M*......Clarinda, Ia.
Huntingdon & Br. Top Mt. 4-8½ g. 62 m. 18 lo. 69 c.
Geo. F. Gage, *Gen. Supt*......Huntingdon, Pa.
Samuel B. Knight, *Pur. Agt*..Philadelphia, Pa.
William Barkla, *M. M*......Saxton, Pa.

I

Illinois Central R. R. 4-8½ g. 1,554 m. 224 lo. 6,172 c.
Jas. C. Clark, *Gen. Man*......Chicago, Ill.
E. T. Jeffery, *Gen. Supt*......Chicago, Ill.
C. A. Beck, *Asst. Gen. Supt*......Chicago, Ill.
O. Ott, *Pur. Agt*......Chicago, Ill.
Henry Schlacks, *S. of Mach*......Chicago, Ill.
W. B. Snow, *M. M. Car Works*.....Chicago, Ill.

Chic. Div.: T. J. Hudson, *Supt*......Cairo, Ill.
Wm. Renshaw, *Act. M. M*......Chicago, Ill.
Mid. Div.: H. L. Frisbie, *Supt*......Pontiac, Ill.
Spring. Div.: W. Wilkinson, *Supt*.Springfield, Ill.
W. B. McKenna, *M. M*......Clinton, Ill.
No'n Div.: J. C. Jacobs, *Supt*......Amboy, Ill.
J. B. Edams, *M. M*......Amboy, Ill.
So. Div.: David Oxley, *M. M*......Centralia, Ill.
Ia. Div.: D. W. Parker, *Supt*......Dubuque, Ia.
Thos. W. Place, *M. M*......Waterloo, Ia.
Illinois Midland Ry. 4-8½ g. 176 m. 12 lo. 611 cars.
D. H. Conklin, *Rec. & Gen. Man*......Decatur, Ill.
O. E. Grady, *Train Mast*......Decatur, Ill.
Frank Young, *For. Shops*......Paris, Ill.
Illinois & St. Louis R. R. 4-8½ g. 18 m. 5 lo. 402 c.
Tho. McKissock, *Gen. Man*......Belleville, Ill.
C. H. Sharman, *Gen. Supt. & P. A*. Belleville, Ill.
W. O. Hewitt, *M. M*......Belleville, Ill.
Charles Rotha, *M. C. B*......E. St. Louis Ill.
Indiana, Bloomington & Western Ry.
4-8¾ g. 712 m. 64 lo. 3,650 cars.
C. E. Henderson, *Gen. Man*. Indianapolis, Ind.
J. H. Wilson, *Gen. Supt*.....Indianapolis, Ind.
H. C. Norton, *Pur. Agt*......Indianapolis, Ind.
B. Warren, *Gen. M. M*......Indianapolis, Ind.
Peoria Div.: I. H. Wilson, *Supt*..Indianapolis, Ind.
E. Hiserodt, *M. M*......Urbana, Ill.
St. Louis Div.: I. H. Wilson, *Supt*.....Indnpls, Ind.
John King, *M. M*......Indianapolis, Ind.
Ohio Div.: D. R. Ennis, *Asst. Supt*.Springfield, Ill.
Jos. S. Porter, *M. M*......Sandusky, O.
Indiana, Illinois & Iowa R. R. 63 miles.
F. M. Drake, *Gen. Man*......Kankakee, Ill.
J. P. Shonts, *Supt*......Kankakee, Ill.
Indianapolis & Vincennes R. R. (*See Penna. Co.*)
Intercolonial Ry. 4-8½ g. 846 m. 135 lo. 4,500 cars.
David Pottinger, *Chief Supt*.....Moncton, N. B.
T. V. Cooke, *Gen. Storekeeper*..Moncton, N. B.
H. A. Whitney, *Mech Supt*......Moncton, N. B.
Ewd. Shaffer, *M. C. B*......Moncton, N. B.
Monc. Div.: J. E. Price, *Supt*..Cambellton, N. B.
Hal. & St. J. Div.: Jas. Coleman, *Supt*..Truro, N. B.
Levis Div.: A. McDonald, *Supt*.Rivière du Loup, Q.
International Ry. 4-8½ g. 69 m. 2 lo. 12 cars.
D. E. McFee, *Supt*......Sherbrooke, Que.
International & Gt. N'n R. R. (*See Mo. Pac. Ry.*)
Iron Mountain & Helena R. R. 4-8½ g. 27 m. 2 lo. 11 c.
Wm. Bailey, *Pres. & Gen. Man*...Helena, Ark.
D. Stillinger, *Supt*......Helena, Ark.
F. M. Green, *Pur. Agt*......Helena, Ark.
Wm. Summers, *M. C. B*......Helena, Ark.
Ithaca, Auburn & Western Ry. 4-8½ g. 38 m.
Fred T. Peet, *Supt*......Auburn, N. Y.
Ira Dunning, *M. M*......Auburn, N. Y.

J

Jacksonville So.-E'n R. R. 4-8½ g. 54 m. 5 lo. 68 c.
E. S. Greenleaf, *Supt*......Jacksonville, Ill.
Ira Petrie, *M. M*......Jacksonville, Ill.
Jacksonv., Pensacola & Mob. (*See Fla. Cent. & W.*)
Jamesville & Washington. 4-8½ g. 22 m. 3 lo. 24 c.
A. Fisher, *Manager*......Dymond City, N. C.
J. E. Lordley, *M. M. & C. B*..Dymond City, N. C.
Jeffersonv'l, Madison & Indpls. R. R. (*See Pa. Co.*)
Jersey City & Albany R. R. 4-8½ g. 38 m.
J. W. McCulloh, *Manager*...Jersey City, N. J.
Junction & Breakwater; Breakwater & Frankford; and Worcester R. Rs. 4-8½ g. 101 m. 6 l. 133 c.
J. & B. Rd.: Thos. Groome, *Supt*....Lewes, Del.
Geo. Messick, *M. M*......Lewes, Del.
W. H. Virden, *M. C. B*......Lewes, Del.
B. & F. and W. Rds.: J. L. Mapes, *St*. Berlin, Md.

K

Kansas Central R. R. (*See Union Pacific.*)
Kansas Cy, Lawrence & So. Kan. 4-8½ g. 396 m. 787 c.
C. C. Wheeler, *Gen. Man*......Topeka, Kan.
J. L. Barnes, *Supt*......Lawrence, Kan.
F. M. Smith, *Pur. Agt*......Topeka, Kan.
T. D. Volk, *M. M*......Ottawa, Kan.
Kansas City, Fort Scott & Gulf R. R. 4-8½ g.
Geo. H. Nettleton, *Gen. Man*..Kansas City, Mo.
L. W. Towne, *Gen. Supt*.....Kansas City, Mo.
H. P. Jacques, *Pur. Agt*.....Kansas City, Mo.
J. S. McCrum, *M. M*......Kansas City, Mo.
A. N. Montier, *M. C. B*......Kansas City, Mo.
Kansas City, St. Joseph & Council Bluffs; and St. Jo. & Des Moines R. Rs. 4-8½ g. 368m. 38 lo. 1,148 cars.
J. F. Barnard, *Gen. Supt. & P. A*.St. Joseph, Mo.
F. A. Chase, *M. M*......St. Joseph, Mo.
Thos. Aylesbury, *G. For. Car. Dep*.St. Joseph, Mo.
Kendall & Eldred R. R. (*See Olean, B. & W.*)
Kent Co.: Sm. & Del. Bay Rds. 4-8½ g. 50 m. 2 lo. 13 c.
Fred Gerker, *Gen. Man*......Chestertown, Md.
Kentucky Central R. R. 4-9 g. 150 m. 20 lo. 598 cars.
G. W. Bender, *Supt*......Covington, Ky.
A. H. Watts, *F. of Mach*......Covington, Ky.
J. L. Hackathorn, *M. C. B*......Covington, Ky.
Kentucky & South Atlantic Ry. 3 g. 23 m. 3 lo. 52 c.
Geo. B. Harper, *Supt. & P. A*..Mt. Sterling, Ky.
S. P. Hatfield, *M. M*......Mt. Sterling, Ky.
Kinzua R. R. (*See Olean, B. & W.*)
Kingston & Pembroke Ry. 4-8½ g. 65 m. 4 lo. 76 c.
B. W. Folger, *Supt*......Kingston, Ont.
C. Gildersleeve, *Pur. Agt*......Kingston, Ont.
Geo. Becker, *M. M*......Kingston, Ont.
Knox & Lincoln R. R. 4-8½ g. 49 m. 5 lo. 95 cars.
C. A. Coombs, *Supt*......Bath, Me.
Wm. A. Field, *M. M*......Bath, Me.
C. L. Turner, *M. C. B*......Bath, Me.
Knoxville & Augusta R. R. 4-6 g. 16 m. 2 lo. 34 cars.
J. M. Hood, *Supt*......Marysville, Tenn.
M. R. Hood, *Pur. Agt*......Marysville, Tenn.

L

Lake Erie & Western Ry. 4-8½ g. 388 m. 43 lo. 1,526 c.
E. H. Waldron, *Gen. Man*......La Fayette, Ind.
E. H. Andress, *Pur. Agt*......La Fayette, Ind.
H. L. Cooper, *Supt. of Equipment*....Lima, O.
D. S. Hill, *Gen. Supt*......Sandusky, O.
Lake Shore & Michigan So'n Ry.
4-8½ g. 1,243 m. 546 lo. 17,115 cars.
John Newell, *Gen. Man*......Cleveland, O.
P. P. Wright, *Gen. Supt*......Cleveland, O.
A. C. Armstrong, *Pur. Agt*......Cleveland, O.
James Sedgley, *Gen. M. M*......Cleveland, O.
John Kirby, *Gen. M. C. B*......Cleveland, O.
Buffalo Div.: C. B. Couch, *Supt*.....Cleveland, O.
J. S. Graham, *M. M*......Buffalo, N. Y.
A. C. Robson, *M. C. B*......Buffalo, N. Y.
Frank. Div.: G. H. McIntire, *Supt*. Stoneboro, Pa.
Erie Div.: C. B. Couch, *Supt*......Cleveland, O.
L. O. Gassett, *M. M*......Cleveland, O.
J. Withycombe, *M. C. B*......Cleveland, O.
Toledo Div.: Thos. Flesher, Jr., *Supt*.Cleveland, O.
J. M. Sanborn, *M. M*......Norwalk, O.
W. O. Smith, *M. C. B*......Norwalk, O.
Mich. Div.: J. E. Curtis, *Supt*......Toledo, O.
Det. Div.: T. J. Charlesworth, *Supt*. Detroit, Mich.
Lansing Div.: W. H. Caniff, *Supt*..Lansing, Mich.
Western Div.: *Supt*...Chicago, Ill.
G. W. Stevens, *M. M*. (M. S. Divs.) Elkhart, Ind.
Frank O. Bray, *M. C. B*......Adrian, Mich.
Ft. Wayne Br: W. H. Caniff, *Supt*. Jackson, Mich.
Lebanon Springs R. R. 4-8½ g.
W. C. Alstyne, *Manager*......Albany, N. Y.
J. K. Hotaling, *Pur. Agt*......Albany, N. Y.
Geo. Tefft, *M. M*......Chatham, N. Y.
Lehigh Valley R. R. 4-8½ g. 545 m. 321 lo. 33,817 c.
H. S. Goodwin, *Gen. Supt*......Bethlehem, Pa.
L. Chamberlain, *Pur. Agt*....Philadelphia, Pa.
John S. Lentz, *M. C. B*......Packerton, Pa.
N. J. Div.: Jas. Donnelly, *Supt*. Perth Amboy, N. J.
John I. Kinsey, *M. M*......So. Easton, Pa.
Coal Rds.: J. I. Blakeslee, *Supt*. Mauch Chunk, Pa.
P. Hofecker, *M. M*......Weatherly, Pa.
John Campbell, *M. M*......Delano, Pa.
B. M. Div.: A. G. Brodhead, *S*..Mauch Chunk, Pa.
D. Clark, *M. M*......Hazleton, Pa.
Wy. Div.: A. Mitchell, *S. & M. M*. Wilkesbarre, Pa.
Pa. & N. Y.; and Geneva, Ithaca & Sayre R. Rs.
Wm. Stevenson, *Supt*......Sayre, Pa.
J. N. Weaver, *M. M*......Waverley, Pa.
Lehigh & Hudson. 4-8½ g. 63 m. 8 lo. 350 cars.
Grinnel Burt, *Gen. Man*......Warwick, N. Y.
John Sayre, *Pur. Agt*......Warwick, N. Y.
S. Mills, *M. M*......Warwick, N. Y.
Ligonier Valley R. R. 4-9 g. 11 m. 2 lo. 22 cars.
Thos. A. Mellon, *Gen. Manager*..Pittsburg, Pa.
Geo. Senft, *Supt. & P. Agt*......Latrobe, Pa.

Little Rock, Miss. River & Texas Ry.
4-8½ g. 160 m. 12 lo. 260 cars.
J. A. Woodson, *G. S. & P. A*. Little Rock, Ark.
F. Hufsmith, *M. M. & C. B*...Arkansas City, Ark.
Little Rock & Fort Smith. 4-8½ g. 168 m. 12 lo. 353 c.
T. Hartman, *Gen. Supt*......Little Rock, Ark.
James Eblin, *M. M*......Argenta, Ark.
James Malone, *M. C. B*......Argenta, Ark.
Long Island R. R. 4-8½ g. 325 m. 79 lo. 740 cars.
I. D. Barton, *Supt*......Long Island City, N. Y.
Benj. Norton, *Pur. Agt*..Long Island City, N. Y.
C. A. Thompson, *M. M. & C. B*. do.
Louis., Evans. & St. L. Ry. 4-8½ g. 254 m. 24 lo. 1,032 c.
Webster Snyder, *Gen. Man*......Louisville, Ky.
W. H. Field, *Pur. Agt*......Louisville, Ky.
F. M. Mast, *M. M*......Evansville, Ind.
Louisville, New Albany & Chicago Ry.
4-8½ g. 470 miles 56 lo. 3,700 cars.
John MacLeod, *Gen. Supt*......Louisville, Ky.
G. C. Breed, *Pur. Agt*......Louisville, Ky.
Josiah Bettis, *M. M. & C. B*...New Albany, Ind.
Louisville & Nashville R. R.
5 g. 2,090 m. 367 lo. 11,353 cars.
Milton H. Smith, *Gen. Man*......Louisville, Ky.
P. P. Huston, *Pur. Agt*......Louisville, Ky.
D. W. C. Rowland, *Gen. Supt. Trans*.Louisville, Ky.
Reuben Wells, *Supt. Mach*.....Louisville, Ky.
Louisv. Divs.; and Louisv., Cin. & Lex. Ry. (Cin. Div.)
J. G. Metcalf, *Supt. Trans*.....Louisville, Ky.
P. Leeds, *M. M*. (Lo. Div.).....Louisville, Ky.
J. W. Luttrell, *M. M*. (Cin. Div.).Louisville, Ky.
W. P. Pike, *M. M*. (2d & C. Div.).Bowling Green, Ky.
Nash. & D. Div.: J. Geddes, *Supt*.Nashville, Tenn.
W. H. Thomas, *M. M*......Nashville, Tenn.
S. & N. A. Div.: E. Marsh, *Supt*. Birmingham, Ala.
C. W. White, *M. M*......Birmingham, Ala.
Mob. & M.; N. Div. Pens. & Sel.; Sl. & Mont. R. Rs.:
M. S. Belknap, *Supt*......Montgomery, Ala.
J. N. Hall, *M. M*. (Mont. Shops). Montgomery, Ala.
N. O. Div.: J. T. Harrihan, *Supt*. New Orleans, La.
Wm. Adair, *M. M*......Mobile, Ala.
Memp. Div.: W. Colcamp, *Supt*. Memphis, Tenn.
J. V. Slusser, *M. M*......Memphis, Tenn.
St. L. Div.: J. Montgomery, *Supt*. Evansville, Ind.
Thos. Walsh, *M. M*......Mt. Vernon, Ill.
Pensacola and So. Div. Pens. & Selma Rds.:
E. O. Saltmarsh, *Supt*......Pensacola, Fla.
R. B. Small, *M. M*......Pensacola, Fla.
Louisville & Wadley R. R. 5 g. 10 m.
J. H. Wilkins, *Pr. & Supt*......Louisville, Ga.

M

Maine Central R. R. 4-8½ g. 470 m. 58 lo. 1,335 c.
Gen. Supt......Portland, Me.
Ira K. Russell, *M. M*......Waterville, Me.
C. H. Kenison, *M. C. B*......Augusta, Me.
Manchester & Keene R. R. (*See B. L. & C.*)
B. F. George, *Asst. Supt*......Keene, N. H.
Manhattan Ry. 4-8½ g. 32 m. 203 lo. 596 pass. c.
Frank K. Hain, *Gen. Man*.....New York, N. Y.
C. L. Green, *Supt*......New York, N. Y.
T. W. Peeples, *M. M*......New York, N. Y.
H. A. Webster, *M. C. B*......New York, N. Y.
Marietta & Cin. R. R. 4-8½ g. 312 m. 65 lo. 1,422 c.
Jas. H. Stewart, *Gen. Man*......Cincinnati, O.
Edw. Evans, *M. M*......Chillicothe, O.
Marietta & North Georgia R. R. 3 g. 24 m. 1 lo. 5 c.
J. B. Glover, *Supt & P. Agt*......Marietta, Ga.
E. A. Withers, *M. M*......Marietta, Ga.
Marquette, Houghton & Ontonagon R. R.
4-8½ g. 87 m. 30 lo. 2,074 cars.
Samuel Schoch, *Gen. Man*.....Marquette, Mich.
M. B. McGee, *Pur. Agt*......Marquette, Mich.
W. H. Williams, *M. M*......Marquette, Mich.
H. D. Lyons, *M. C. B*......Marquette, Mich.
Massachusetts Central R. R. 4-8½ g. 48 m.
E. G. Allen, *Supt. & P. A*......Boston, Mass.
Memphis & Charleston R. R. (*See E. Tenn. Va. & Ga.*)
Memphis & Lit. Rock R. R. 5 g. 135 m. 14 lo. 272 c.
E. K. Sibley, *G. Man. & P. A*..Little Rock, Ark.
H. G. Fleming, *Supt*......Memphis, Tenn.
Thos. Rennell, *M. M*......Argenta, Ark.
P. Twitchell, *M. C. B*......Argenta, Ark.
Mexican Central Ry.
Howard Hinckley, *Pur. Agt*......Boston, Mass.
Main Line:
Rudolph Fink, *Gen. Man*.....City of Mexico.
J. H. Garner, *Supt. Trans*....City of Mexico.
F. W. Johnson, *M. M*......City of Mexico.
J. H. O'Brien, *M. C. B*......City of Mexico.
Chihuahua Div.:
D. B. Robinson, *G. Supt*. El Paso del Norte, Mex.
J. N. Lauder, *Supt. R. S*..El Paso del Norte, Mex.
Tampico Div.:
Edward A. Whorf, *Supt*......Tampico, Mex.
Mexican National Ry. (*See Tex.-Mex.*)
Michigan Cen. R. R. 4-8½ g. 1,013 m. 266 lo. 8,000 c.
H. B. Ledyard, *Gen. Man*......Detroit, Mich.
E. C. Brown, *Gen. Supt*......Detroit, Mich.
W. P. Taylor, *Gen. Supt*......Buffalo, N. Y.
Allan Bourn, *Pur. Agt*......Detroit, Mich.
S. H. Edgerly, *Gen. M. M*......Jackson, Mich.
Robert Miller, *Gen. M. C. B*......Detroit, Mich.
East. Div.: D. S. Sutherland, *Supt*. Detroit, Mich.
Bay City, Saginaw & Mackinaw Divisions.:
W. A. Vaughan, *Supt*......Bay City, Mich.
C. E. Smart, *M. M*......Bay City, Mich.
Main Line: Gr. Rap.; So. Bend; and So. Hav. Divs.:
C. B. Bush, *Supt*......Jackson, Mich.
W'n Divs.: R. H. L'Hommedieu, *Supt*. Chicago, Ill.
Middleburg & Schoharie; and
Schoharie Valley R. Rs. 4-8½ g. 10 m. 2 lo. 4 cars
S. S. Danforth, *Gen. Supt*...Middleburg, N. Y.
Midland of Canada. 4-8½ g. 143 m. 12 lo. 503 cars.
Geo. A. Cox, *Gen. Man*.....Peterborough, Ont.
W. B. Ferguson, *Gen. Supt*. Peterborough, Ont.
C. H. Crofts, *Storekeeper*...Peterborough, Ont.
J. Haggas, *Mech. Supt*......Port Hope, Ont.
Edward Douglas, *M. C. B*....Port Hope, Ont.
H. H. Harry, *M. C. B*......Lindsay, Ont.
Toronto & Nipissing Div. 3-6 g. 105 m. 12 lo. 211 c.
J. Haggas, *M. M*......Uxbridge, Ont.
Chas. E. Caron, *M. C. B*......Uxbridge, Ont.
Midland No. Car. Ry. 5 g. 95 m. 9 lo. 82 cars.
J. W. Andrews, *Gen. Man*......Newbern, N. C.
Jno. P. Caddagan, *Pur. Agt*....Newbern, N. C.
J. W. Andrews, *Supt*......Goldsboro, N. C.
B. Manly, *Supt. of Mach*......Newbern, N. C.
Milwaukee, Lake Shore & Western Ry.
4-8½ g. 322 m. 40 lo. 1,536 cars.
H. G. H. Reed, *Gen. Man. & P. Agt*. Milwaukee, Wis.
J. Donahue, *Supt*......Milwaukee, Wis.
Chas. S. Hayden, *Asst. Supt*...Manitowoc, Wis.
David B. Curtis, *Asst. Supt*......Oshkosh, Wis.
John Hickey, *M. M*......Manitowoc, Wis.
Milwaukee & Northern.
C. F. Dutton, *Gen. Supt*......Milwaukee, Wis.
N. S. Kimball, *M. M*......Green Bay, Wis.
Mineral Range R. R. 3 g. 13 m. 4 lo. 42 cars.
Chas. E. Holland, *Pr. & Supt*...Hancock, Mich.
W. H. Carr, *Pur. Agt*......Hancock, Mich.
T. J. Shellhorn, *M. M. & C. B*. Hancock, Mich.
Minneapolis, Lyndale & Minnetonka Ry.
3 g. 20 m. 1 lo. 4 motors 39 cars.
Wm. McCrory, *Supt. & Pur. Agt*., and
R. Curtis, *M. M*......Minneapolis, Minn.
Minneapolis & St. L. Ry. 4-8½ g. 506 m. 60 lo. 1,850 c.
C. H. Hudson, *Gen. Man*....Minneapolis, Minn.
E. Ryder, *Gen. Supt. & Pur. Agt*. Min'p's, Minn.
Geo. F. Wilson, *Supt. of M*. Minneapolis, Minn.
Mississippi & Tenn. R. R. 4-8½ g. 101 m. 11 lo. 194 c.
M. Burke, *Gen. Supt*......Memphis, Tenn.
J. C. Ramsey, *M. M*......Memphis, Tenn.
S. J. Bolton, *M. C. B*......Memphis, Tenn.
Missouri Pacific Ry. (Leased and operated lines.)
4-8½ g. 5,785 m. 626 lo. 16,119 cars.
A. A. Talmage, *Gen. Man*......St. Louis, Mo.
R. B. Lyle, *Pur. Agt*......St. Louis, Mo.
H. H. Sessions, *M. C. B*......Marshall, Tex.
(1) Missouri Pac Ry. 4-8½ g. 2,708 m. 324 lo. 10,000 c.
John Hewitt, *Supt. Mach*......St. Louis, Mo.
John Hodge, *Supt. Car Dep*......St. Louis, Mo.
Main Line: Warder Cumming, *Supt*..Sedalia, Mo.
C. L. Dunham, *Supt*. W'n Div., Kansas City, Mo.
Le Roy Bartlett, *Asst. M. M*....St. Louis, Mo.
Geo. Walshe, *M. M*......Sedalia, Mo.
M., K. & Tex. Div., J. M. Eddy, *Supt*. Sedalia, Mo.
J. C. Barber, *Asst. Supt. Car Dep*.Sedalia, Mo.
J. W. Haines, *M. M*......Parsons, Kan.

Cen. Br. Div., W. W. Fagan, Supt. Atchison, Kan.
H. V. Faries, M. M. Atchison, Kan.
S. Irvin, Asst. Supt. Car Dep. Atchison, Kan.
(1) St. L., I. M. & So. 4-8½ g. 816 m. 141 lo. 4,860 c.
Wm. Kerrigan, Supt. Louis, Mo.
O. A. Haynes, S. M. P. & M. De Soto, Mo.
St. Louis Div.: W. H. Harris, M. M. De Soto, Mo.
Ark. Div.: R. M. Richardson, M. M. Little Rock, Ark.
(2) Texas & Pac. 4-8½ g. 1,322 m. 144 lo. 3,076 c.
E. L. Dudley, Supt. Marshall, Tex.
O. A. Haynes, S. M. P. & M. Marshall, Tex.
New Or. Div.: C. Fleming, Supt. Gaddsboro, La.
Perry Sternes, M. M. Marshall, Tex.
Eastern Div.: J. Williams, Supt. Longview, Tex.
Rio Gr. Div.: G. O. Clinton, Supt. Big Springs, Tex.
W. H. Reilly, M. M. Fort Worth, Tex.
J. E. Wiggin, M. M. Big Springs, Tex.
(3) Int. & G. North. 4-8½ g. 776 m. 73 lo. 1,712 c.
Jos. Harrin, Supt. Palestine, Tex.
O. A. Haynes, S. M. P. & M. Palestine, Tex.
O. H. Johnson, M. M. Palestine, Tex.
Mobile & Ala. Grand Trunk R. R. 5 g. 59 m. 2 lo. 23 c.
Wm. H. Pratt, Trustee Mobile, Ala.
Mobile & Girard R. R. 5 g. 84 m. 7 lo. 112 cars.
W. L. Clark, Gen. Supt. Columbus, Ga.
J. C. Albrecht, M. M. Columbus, Ga.
A. J. Nix, M. C. B. Columbus, Ga.
Mobile & Ohio R. R. 5 g. 528 m. 75 lo. 1,353 cars.
A. L. Rives, V. Pr. & Gen. Man. Mobile, Ala.
R. H. Briggs, Gen. M. M. Whistler, Ala.
J. T. Booth, M. C. B. Whistler, Ala.
So'n Div., I. G. Motley, Supt. Mobile, Ala.
John Fitzgerald, M. M. Macon, Miss.
No'n Div.: E. S. Horsford, Supt. Jackson, Tenn.
M. T. Carson, M. M. Jackson, Tenn.
Mobile & Spring Hill R. R. 5 g. 8 m. 10 lo. 90 cars.
F. Ingate, Supt. Mobile, Ala.
Mont Alto R. R. 4-9 g. 21 m. 2 lo. 3 cars.
G. B. Weistling, Supt. & P. A. Mont Alto, Pa.
Montpelier & Wells Riv. R. R. 4-8½ g. 38 m. 3 lo. 76c.
Supt. Montpelier, Vt.
Morgan's Louisiana & Tex. R. R. 4-8½ g. 165 m.
G. Pandeley, Supt. New Orleans, La.
C. Trumpy, Pur. Agt. New Orleans, La.
N. Tilton, M. M. Algiers, La.
Wm. O'Brien, M. C. B. Algiers, La.
Muncy Creek Ry. 4-8½ g. 10 m.
Benj. G. Welch, Rec. & P. Agt. Hughesville, Pa.
J. V. Chamberlain, Supt. & M. M. do.

N

Nashville, Chattanooga & St. Louis R'y.,
5 g. 508 miles 87 lo. 1,979 cars.
J. W. Thomas, G. Supt. & P. Agt. Nashville, Tenn.
M. J. C. Wrenne, Supt. Nashville, Tenn.
James Cullen, M. M. & C. B. Nashville, Tenn.
Natchez, Jackson & Col. R. R. 3-6 g. 98 m. 7 lo. 72 c.
Belton Mickle, Supt. Natchez, Miss.
Naugatuck R. R., 4-8½ g. 61 miles, 14 lo. 384 cars.
Geo. W. Beach, Supt. Waterbury, Ct.
Henry Hanford, M. M. Bridgeport, Ct.
Geo. W. Gray, M. C. B. Bridgeport, Ct.
Nevada Central R. R. (See Union Pac.)
Nevada County N. G. R. R. 3 g. 23 m. 3 lo. 46 cars.
John F. Kidder, Supt. Grass Valley, Cal.
Jas. McCormick, M. M. & C. B. Grass Valley, Cal.
New Brunswick Ry. 4-8½ g. 194 m. 12 lo. 266 cars.
E. R. Burpee, Gen. Man. Gibson, N. B.
Henry Osborn, Gen. Supt. Gibson, N. B.
Alfred Seely, Pur. Agt. Gibson, N. B.
Jesse Mathews, M. M. Gibson, N. B.
T. N. Burpee, M. C. B. Gibson, N. B.
New Brunswick & Can. Ry. 4-8½ g. 127 m. 12 lo. 184c.
Henry Osborn, G. M. & P. A. St. Andrew's, N. B.
John Stewart, Supt. St. Stephen, N. B.
Thos. Armstrong, M. M. St. Andrew's, N. B.
G. Houlton, M. C. B. St. Andrew's, N. B.
New Haven & Derby R. R. 4-8½ g. 13 m. 3 lo. 58 c.
E. S. Quintard, Supt. New Haven, Conn.
J. M. Whitlock, M. M. & C. B. New Haven, Conn.
New Haven & No'mpton. 4-8½ g. 135 m. 26 lo. 572 c.
C. A. Goodnow, Supt. New Haven, Ct.
C. N. Yeamans, Pur. Agt. New Haven, Ct.
Henry Fox, M. M. New Haven, Ct.
John Sweeny, M. C. B. New Haven, Ct.
New Jersey & New York Ry. 4-6 g. 43 m. 6 lo. 41 c.
J. D. Hasbrouck, Gen. Man. Jersey City, N. J.
J. S. Drake, Supt. & M. M. Hillsdale, N. J.
L. B. Van Wagonen, M. C. B. Hillsdale, N. J.
New Jersey Southern Ry. (See Central, N. J.)
New London Northern R. R. (See Central Ver.)
New Orleans Pacific Ry. 5 g. 85 m. 10 lo. 206 cars.
H. S. Morse, Supt. New Orleans, La.
E. R. Smith, M. M. & C. B. New Orleans, La.
N. Y. Central & Hudson River R.R.
4-8½ g. 962 m. 676 lo. 22 539 cars.
J. M. Toucey, Gen. Supt. New York, N. Y.
R. C. Moore, Pur. Agt. New York, N. Y.
Wm. Buchanan, Supt. M. P. New York, N. Y.
L. Garey, Supt. Car Dept. New York, N. Y.
N. Y. & Har. Div.: C. M. Bissell, Supt. do.
P. McQ Gibson, M. M. New York, N. Y.
C. E. Garey, M. C. B. Morrisania, N. Y.
Hud. Riv. Div.: C. M. Bissell, Supt. N. York, N. Y.
Peter Smith, M. C. B. New York, N. Y.
E'n Div.: Zenas C. Priest, Supt. Utica, N. Y.
G. B. Van Vorst, M. M. West Albany, N. Y.
D. Holt, M. C. B. West Albany, N. Y.
W'n Div.: Geo. H. Burrows, Supt. Rochester, N. Y.
S. L. White, M. M. Syracuse, N. Y.
Amos Gould, M. M. E. Buffalo, N. Y.
E. A. Olmstead, M. C. B. E. Buffalo, N. Y.
C. H. Burchard, M. C. B. E. Rochester, N. Y.
Ed. Donahy, M. C. B. Niagara Falls, N. Y.
N. Y. Chic. & St. L. Ry. 4-8½ g. 269 m. 115 lo. 4,838 c.
Lewis Williams, Gen. Man. Cleveland, O.
E. Dwight, Gen. Supt. Cleveland, O.
Jno. W. Dougherty, Pur. Agt. Cleveland, O.
E. P. Boatman, Supt. M. P. Cleveland, O.
Eas'tn Div.: G. H. Kimball, Supt. Cleveland, O.
E. A. Miller, M. M. Conneaut, O.
West'n Div.: E. E. Dwight, Supt. Chicago, Ill.
Jas. Eckford, M. M. Bellevue, O.
New York City & Northern. 4-8½ g. 52 m. 7 lo. 91 c.
Frank S. Gannon, Gen. Supt. High Bridge, N. Y.
Theo. Wheeler, M. M. High Bridge, N. Y.
New York, Lake Erie & Western R. R.
4-8½ g. 1,020 m. 568 loco. 30,500 cars.
Robt. Harris, V. Pr. & G. Man. New York, N. Y.
E. S. Bowen, Gen. Supt. New York, N. Y.
J. A. Hardenburg, Pur. Agt. New York, N. Y.
F. M. Wilder, Supt. M. P. & M. Susqueh'a, Pa.
E'n Div.: E. O. Hill, Supt. Jersey City, N. J.
J. H. Vreeland, M. M. Jersey City, N. J.
J. N. Mileham, M. C. B. Jersey City, N. J.
Del. Div.: W. J. Murphy Supt. Port Jervis, N. Y.
J. Van Vechten, M. M. & C. B. Pt. Jervis, N. Y.
Susq. Div.: R. B. Cable, Supt. Elmira, N. Y.
V. Blackburn, M. M. Susquehanna, Pa.
D. B. Goodell, M. C. B. Elmira, N. Y.
Buf. & R. Divs.: Chas. Neilson, Supt.; and
G. B. Ross, M. M. Buffalo, N. Y.
M. Wilder, M. C. B. Buffalo, N. Y.
B. & S.-W. Div.: C. A. Brunn, Supt. do.
W'n Div.: W. B. Coffin, Supt. Hornellsville, N. Y.
R. Gunn, M. M. Hornellsville, N. Y.
New York, New Haven & Hartford R. R.
4-8½ g. 203 m. 123 lo. 2,768 cars.
E. M. Reed, V. P. & Gen. Man. New Haven, Ct.
R. N. Dowd, Pur. Agt. New Haven, Ct.
N. Y. & N. H. Div.: W. H. Stevenson, Supt. N. Y.
Air Line Div.: O. M. Shepard Supt. N. Haven, Ct.
H. Kettendorf, Supt. M. P. New Haven, Ct.
Jas. Deuver, M. C. B. New Haven, Ct.
Hart. Div.: C. S. Davidson, Supt. Hartford, Ct.
John Henny, Jr., Supt. M. P. & M. C. B. do.
New York, Ontario & Western Ry.
4-8½ g. 345 m. 79 lo. 1,539 cars.
Jas. E. Childs, Gen. Supt. New York, N. Y.
I. W. Fowler, Pur. Agt. Midd'etown, N. Y.
Edw. Minshull, M. M. & C. B. Middletown, N. Y.
Mid. Div.: N. R. Hankins, Supt. Middletown, N. Y.
No'n Div.: C. W. Lanpher, Supt. Norwich, N. Y.
So. Div.: E. Canfield, Supt. Tappan, N. Y.
New York, Pennsylvania & Ohio R. R.
4-8½ g. 564 m. 218 lo. 7,394 cars.
J. M. Ferris, Gen. Man. Cleveland, Ohio.

J. H. Holway, Pur. Agt. Cleveland, Ohio.
Wm. Fuller, Gen. M. M. & C. B. Cleveland, O.
S. V. Smith, Asst. Gen. M. C. B. Kent, Ohio.
E'n Div.: A. L. Dunbar, Supt. Meadville, Pa.
J. A. Cooper, M. M. Meadville, Pa.
D. S. Dockstader, M. C. Rep. Meadville, Pa.
J. T. Fosdick, For. Car Rep. Salamanca, N. Y.
W'n Div.: J. W. Alsop, Supt. Galion, O.
Wm Hill, M. M. Galion, O.
J. W. Holmes, For. Car Rep. Galion, O.
Geo. Wilson, For. Car Rep. Dayton, Ohio.
Maho'g Div.: N. F. Wood, Supt. Cleveland, O.
N. Wright, M. M. Cleveland, O.
C. N. Thorp, M. C. Rep. Cleveland, O.
New York, Providence & Boston R. R.
4-8½ g. 72 m. 29 lo. 430 cars.
J. B. Gardner, Supt. Providence, R. I.
Giles F. Ward, Pur. Agt. Stonington, Conn.
J. H. Anderson, M. M. & C. B. Providence, R. I.
N. Y., Susquehanna & W'n. 4-9 g. 135 m. 28 lo. 925 c.
H. M. Britton, Gen. M. & P. A. New York, N. Y.
W. C. Ennis, M. M. & C. B. Wortendyke, N. J.
New York, West Shore & Buffalo Ry.
Chas. Paine, Gen. Man. New York, N. Y.
Howard Fry, Supt. M. P. New York, N. Y.
P. S. Bemis, Pur. Agt. New York, N. Y.
Walkill Ry. G. H. Graves, Supt. Rondout, N. Y.
New York, Woodhaven & Rockaway R. R.
4-8½ g. 26 m. 8 lo. 101 cars.
J. M. Lunt, Supt. & P. Agt. Hunter's Pt., L. I.
W. B. Turner, M. M. Hunter's Point, L. I.
N. Y. & Greenwood Lake Ry. 4-8½ g. 44 m. 8 lo. 53 c.
Stephen Smith, Supt. Jersey City, N. J.
J. A. Hardenburg, Pur. Agt. New York, N. Y.
G. A. Hill, M. M. Pompton, N. J.
N. Y. & Manhattan Beach Ry. 3 g. 23 m. 12 lo. 128 c.
D. C. Corbin, Man. Dir. New York, N. Y.
O. Fairhurst, M. M. Greenpoint, L. I.
New York & New England R. R.
4-8½ g. 463 m. 127 lo. 3,326 cars.
S. M. Felton, Jr., Gen. Man. Boston, Mass.
W. W. McKim, Pur. Agt. Boston, Mass.
Ross Kells, Supt. M. P. Boston, Mass.
A. K. Mansfield, Mech. Eng. Boston, Mass.
D. P. Wright, M. M. Norwood, Mass.
H. E. Barker, Gen. Fore. Norwood, Mass.
East Div: C. C. F. Bent, Supt. Boston, Mass.
C. B. Moore, M. M. Boston, Mass.
Nor. Div.: P. St. M. Andrews, Supt. Norwich, Ct.
W. A. Stone, M. M. Norwich, Ct.
Prov. Div.: L. W. Palmer, Supt. Providence, R. I.
Hfd. Div.: E. Holbrook, Supt. Hartford, Ct.
E. M. Humstone, M. M. Hartford, Ct.
D. F. Andregg, For. C. Dept. Hartford, Ct.
Newburg, Dutchess & Conn. R. R. 4-8½ g. 58 miles.
C. L. Kimball, Gen. Supt. Matteawan, N. Y.
W. G. Van Buskirk, M. M. & C. B. do
Norfolk & Western R. R. 5 g. 428 m. 82 lo. 1,220 c.
Henry Fink, 2d V. Pr. & Gen. Man. Lynchb'g, Va.
W. C. De Armond, Pur. Agt. Philadelphia, Pa.
C. Blackwell, Supt. M. P. Roanoke, Va.
West'n Div.: Frank Huger, Supt. Lynchburg, Va.
F. Sterk, M. M. Lynchburg, Va.
East'n Div.: N. M. Osborne, Supt. Petersburg, Va.
J. T. Robinett, M. M. & C. B. Petersburg, Va.
North-Eastern R. R. of Ga. 5 g. 40 m. 2 lo. 18 cars.
H. R. Bernard, Supt. Athens, Ga.
North-Eastern R. R. (S. C.) (See Wil. & Wel.
North Pacific Coast R. R. 3 g. 84 m. 12 lo. 320 cars.
David Nye, Gen. Supt. San Rafael, Cal.
W. F. Russell, Pur. Agt. San Francisco, Cal.
J. Fowler, M. M. Sancelito Cal.
North Shore
A. Davis, Gen. Man. Quebec, Can.
Northern (N. H.), and Concord & Claremont Rys.
4-8½ g. 173 m. 25 lo. 569 cars.
Geo. E. Todd, Supt. Concord, N. H.
Ed. Studley, M. M. & C. B. & Pur. Agt. do.
Northern (N. J.) R. R. (See N. Y., L. E. & W'n.)
Northern Central Ry. (See Penna. (R. R.)
North'n Pacific R. R. 4-8½ g. 1,193 m. 104 lo. 3,089 c.
Herman Haupt, Gen. Man. St. Paul, Minn.
John H. Ames, Pur. Agt. St. Paul, Minn.
Geo. W. Cross, Supt. Trans. St. Paul, Minn.
Geo. W. Cushing, Supt. M. P., M. & R. S. do.
W. T. Small, Asst. S. M. P. & M. do.
St. P. & Minn. Divs.: B. McHugh, Supt., do.
H. J. Small, A. S. Mach. (E. D.) Brainerd, Minn.
Frank Howard, M. C. B. Brainerd, Minn.
Dakota Div.: J. T. Odell, Supt. Fargo, Dak.
A. Rupert, M. M. Fargo, Dak.
Mo. Div.: D. R. Taylor, Supt. Mandan, Dak.
E. F. Doran, M. M. Mandan, Dak.
Yell'st'e Div.: S. R. Ainslie, Supt. Glendive, Mont.
S. L. Bean, M. M. Glendive, Mont.
G. S. La Rue, M. M. Billings, Mont.
(2) Western Div.: J. W. Sprague, Gen. Supt.; and
Otis Sprague, Supt. New Tacoma, W. T.
H. D. Sanborn, Pur. Agt. Portland, Ore.
W. T. Small, A. S. Mach. (W. D.) Sprague, W. T.
F. C. Ford, M. M. New Tacoma, W. T.
S. Wishart, M. C. B. New Tacoma, W. T.
Pend d'Ore Div.:
H. W. Fairweather, Supt. Ainsworth, W. T.
J. F. Curtis, M. M. Sprague, W. T.
Northern & North-W'n Ry. 5-6 & 4-8½ g. 50 lo. 1,033 c.
James Webster, Supt. Toronto, Can.
W. C. Schreeber, Pur. Agt. Toronto, Can.
P. Clarke, M. M. Toronto, Can.

O

Ogdensburg & Lake Champlain R. R.
4-8½ g. 122 m. 33 lo. 1,160 cars.
A. A. Gaddis, Gen. Man. Ogdensburg, N. Y.
Abr. Klohs, Supt. & M. M. Malone, N. Y.
Ohio Central R. R. 4-8½ g. 230 m. 45 lo. 4,760 cars.
John E. Martin, Gen. Man. Toledo, O.
T. M. Peeler, Supt. Bucyrus, O.
F. W. Stewart, Pur. Agt. Toledo, O.
J. B. Morgan, M. M. & C. B. Bucyrus, O.
Ohio Southern. 4-8½ g. 119 m. 19 lo. 623 cars.
D. R. Ennis, Supt. Springfield, O.
H. C. Norton, Pur. Agt. Indianapolis, Ind.
W. B. Warren, M. M. Springfield, O.
Ohio & Mississippi Ry. 4-9 g. 615 m. 112 lo. 2,501 cars.
W. W. Peabody, Gen. Supt. Cincinnati, O.
G. E. Atwood, Pur. Agt. Cincinnati, O.
J. H. Setchel, Gen. M. M. Vincennes, Ind.
Cin. Div.: C. B. Cole, Supt. Seymour, Ind.
John Thumser, M. M. Seymour, Ind.
J. P. Coulter, M. C. B. Aurora, Ind.
Arthur Donaldson, M. M. Vincennes, Ind.
St. L. & Sp. Div.: C. M. Stanton, Supt. St. Louis, Mo.
J. W. Stokes, M. M. (Spring. Div.). Pana, Ill.
Louisv. Div.: C. B. Cole, Supt. Louisville, Ky.
Oil City & Chicago R. R. 4-9 g. 36 m. 6 lo. 50 cars.
A. Vandiwort, Supt. New Castle, Pa.
Oil City & Ridgway R. R. 4-8½ g. 6 m. 1 lo. 43 cars.
A. F. Kent, Gen. Man. Oil City, Pa.
Old Colony R. R. 4-8½ g. 463 m. 110 lo. 2,862 cars.
J. R. Kendrick, Gen. Supt. Boston, Mass.
Main Li. Div.: J. H. French, Supt. Boston, Mass.
R. W. Husted, Pur. Agt. Boston, Mass.
J. K. Taylor, M. M. Boston, Mass.
A. Gleason, M. C. B. Boston, Mass.
Cape Cod Div.: C. H. Nye, Supt. Hyannis, Mass.
No. Div.: S. A. Webber, Supt. Fitchburg, Mass.
George W. Reynolds, M. M. Taunton, Mass.
Sam. Stevens, M. C. B. Taunton, Mass.
Olean, Bradford & Warren; Bradford; Kinzua; and
Kendall & Eldred R. Rs. 3 g. 38 m. 9 lo. 222 cars.
J. W. Watson, Gen. Supt. Olean, N. Y.
J. H. Poole, Pur. Agt. Buffalo, N. Y.
Charles Turner, M. M. & C. B. Olean, N. Y.
Oregon Ry. & Nav. Co. 4 8-½ g. 225 m. 31 lo. 930 cars.
C. H. Prescott, Manager Portland, Ore.
J. M. Buckley, Asst. Man. & Act. Supt. do.
K. Von Oterendorf, Supt. (O. Div.) S. F'cisco, Cal.
J. M. Drake, Pur. Agt. Portland, Ore.
C. C. Hobart, Gen. M. M. The Dalles, Ore.
Chas. A. Phipps, M. C. B. The Dalles, Ore.
N. G. Div.: Wm. Reed, Man. Portland, Ore.
James Walsh, M. M. Portland, Ore.
Oregon & California R. R. 4-8½ g. 200 m. 14 lo. 280 c.
R. Koehler, Act. Man. Portland, Ore.
J. Brandt, Gen. Supt. Portland, Ore.
A. Brandt, M. M. Portland, Ore.

Owensboro & Nashville R. R. 5 g. 44 m. 3 lo. 70 c.
R. S. Bevier, Act. Supt. Owensboro, Ky.
H. M. Gabel, M. M. & C. B. Owensboro, Ky.

P

Pacific Coast Ry. 3 g. 11 m.
J. M. Fillmore, Manager San Luis Obispo, Cal.
W. H. Masterman, M. M. & C. B. do.
Painesville & Youngstown R. R. 3 g. 65 m. 7 lo. 319 c.
R. K. Paige, Rec. & Man. Painesville, O.
J. A. Newcome, Supt. Painesville, O.
E. B. Baldwin, M. M. Painesville, O.
Panama R. R. 5 g. 58 m. 14 lo. 534 cars.
H. A. Woods, Supt. Aspinwall, U. S. Col.
E. Z. Penfield, Pur. Agt. New York, N. Y.
W. F. Ray, M. M. Aspinwall, U. S. Col.
Parker & Karns City; and
Karns City & Butler R. Rs. 3 g. 27 m. 5 lo. 84 cars.
W. C. Moberly Gen. Supt. Parker City, Pa.
Philip Davies, M. M. Parker City, Pa.
Wm. Wolford, M. C. B. Parker City, Pa.
Passumpsic R. R. 4-8½ g. 145 m. 28 lo. 980 cars.
E. Raymond, Pres. & Pur. Agt. Boston, Mass.
H. E. Folsom, Supt. Lyndonville, Vt.
L. L. Brigham, M. M. Lyndonville, Vt.
L. F. Woodard, M. C. B. Lyndonville, Vt.
Peach Bottom R. R. 3 g. 55 m. 6 lo. 52 cars.
Samuel Dickey, Gen. Man. York, Pa.
G. R. Dickey, Supt. & Pur. Agt. York, Pa.
E. H. Williams, M. C. B. York, Pa.
E. Div.: S. Dickey, Supt. Oxford, Pa.
W. P. Kirk, M. M. Oxford, Pa.
Pennsylvania Co.'s (9) Roads.
4-9 g. 2,838 m. 817 lo. 29,432 cars.
Wm. Mullins, Gen. Pur. Agt. Pittsburg, Pa.
Joseph Wood, Supt. M. P. Fort Wayne, Ind.
(1) Clev. & Pittsb'g R. R. 4-9 g. 224 m. 97 lo. 3,336 c.
R. F. Smith, Asst. Man. Cleveland, O.
Philip Bruner, Supt. Wellsville, O.
W. F. Beardsley, Mast. of Mach. Wellsville, O.
(2 & 3) Erie & Ashtabula Rds. 178 m. 29 lo. 1,340 c.
John M. Kimball, Supt. Youngstown, O.
J. A. Wood, Gen. For. Shops Erie, Pa.
(4) Indianap. & Vincennes Rd. 117 m. 11 lo. 303 cars.
Jas. J. Turner, Supt. Indianapolis, Ind.
M. M.
(5) Jeffersonville, Madison & Indianapolis R. R.
4-9 g. 217 m. 47 lo. 784 cars.
E. W. McKenna, Supt. Louisville, Ky.
Wm. Swanston, M. M. Jeffersonville, Ind.
Edw. Austin, M. C. B. Jeffersonville, Ind.
(6) Northwestern Ohio Ry. 4-9 g. 79 m.
J. S. Morris, Supt. Toledo, O.
(7) Pittsburg, Ft. Wayne & Chicago Ry.
4-9 g. 468 m. 278 lo. 6,782 cars.
E'n Div.: A. B. Starr, Supt. Allegheny, Pa.
Geo. J. Parkin, M. M. Allegheny, Pa.
D. M. Peppard, M. M. Crestline, O.
W'n Div.: C. D. Law, Supt. Ft. Wayne, Ind.
F. D. Casanave, M. M. Ft. Wayne, Ind.
A. H. Somers, Gen. For. Shops Chicago, Ill.
(8) Pittsburg, Cincinnati & St. Louis Ry.
4-9 g. 1,172 m. 336 lo. 6,482 cars.
Jas. McCrea, Gen. Supt. Columbus, O.
R. H. Soule, Supt. M. P. & M. Columbus, O.
P. & Col. Div.: E. B. Taylor, Supt. Dennison, O.
C. B. Street, M. M. Dennison, O.
A. K. Mansfield, M. C. B. Steubenville, O.
Robt. Curtis, M. M. Columbus, O.
Thos. Chamberlain, M. C. B. Columbus, O.
C. & M. V. Div.: W. F. Black, Supt. Zanesville, O.
Leroy Kells, M. M. Lancaster, O.
Daniel Jewell, M. C. B. Lancaster, O.
Li. Mi. Div.: Ralph Peters, Supt. Cincinnati, O.
Leroy Kells, M. M. Cincinnati, O.
Jos. Underwood, Gen. Foreman. Cincinnati, O.
Ind. Divs.: J. F. Miller, Supt. Richmond, Ind.
W. W. Reynolds, M. M. Logansport, Ind.
Chas. H. Starr, M. C. B. Logansport, Ind.
M. J. Rogers, M. M. Indianapolis, Ind.
Chi. Div.: Chas. Watts, Supt. Logansport, Ind.
(9) Terre Haute & Indianapolis R. R.
4-9 g. 374 m. 83 lo. 2,868 cars.
Joseph Hill, Gen. Supt. St. Louis, Mo.
C. R. Peddle, P. Agt. St. Louis, Mo.
Geo. H. Prescott, S. M. P. & M. Terre Haute, Ind.
E. D. Carter, M. C. B. Terre Haute, Ind.
Clinton Idler, M. M. Indianapolis, Ind.
Chas. Butler, M. M. Effingham, Ill.
A. W. Quakenbush, M. M. Logansport, Ind.
Pennsylvania R. R. Co.'s Roads. (7 Gen. Divs.)
4-9 g. 2,704 m. 1,271 loco. 51,894 cars.
Chas. E. Pugh, Gen. Man. Philadelphia, Pa.
Enoch Lewis, Pur. Agt. Philadelphia, Pa.
John Reilly, Supt. Trans. Philadelphia, Pa.
T. N. Ely, Gen. S. M. P. (4 Gen. Divs.) Altoona, Pa.
(1) Pennsylvania R. R. Divs.
4-9 g. 1,105 m. 627 lo. 35,583 cars.
S. M. Prevost, Gen. Supt. Altoona, Pa.
Frank L. Sheppard, Supt. M. P. Altoona, Pa.
G. W. Strattan, M. M. Altoona, Pa.
Jno. P. Levan, Gen. Fore. Altoona, Pa.
Phila. Div.: Wm. J. Latta, Supt. Philadelphia, Pa.
H. D. Garrett, M. M. W. Philadelphia, Pa.
I. W. Van Houten, Gen. For. W. Phila., Pa.
Mid. Div.: H. H. Carter, Supt. Harrisburg, Pa.
E. L. Caum, M. M. Harrisburg, Pa.
Samuel W. Myers, Gen. For. Harrisburg, Pa.
Alt'a Div.: Jas. Reed, Supt. Altoona, Pa.
Pitts. Div.: Robert Pitcairn, Supt. Pittsburg, Pa.
D. O. Shaver, M. M. Pittsburg, Pa.
J. G. Stewart, Gen. For. Pittsburg, Pa.
W. Pa. Div.: A. P. Kirtland, Supt. Blairsville, Pa.
Wm. B. Norris, M. M. Blairsville, Pa.
M. H. Falls, Gen. For. Blairsville, Pa.
Fred. Div.: J. B. Hutchinson, Supt. York, Pa.
Tyrone Div.: S. S. Blair, Supt. Tyrone, Pa.
Lew. Div.: Wm. M. Phillips, Supt. Lewistown, Pa.
Bed. Div.: Thos. A. Roberts, Supt. Bedford, Pa.
Monong. Div.: David M. Watt, Supt. Pittsburg, Pa.
Wm. Lininger, M. M. Pittsburg, Pa.
(2) United R. Rs. of N. J. Divs. 414 m. 257 lo. 4,668 c.
F. Wolcott Jackson, Gen. St. Jersey City, N. J.
N. Y. Div.: Robt. E. Pettit, Supt. Jersey City, N. J.
H. S. Hayward, St. M. P. Jersey City, N. J.
David H. Baker, Gen. For. Jersey City, N. J.
L. A. Bosdevex, M. M. Jersey City, N. J.
E. F. Bosdevex, Gen. For. Jersey City, N. J.
Belv. Div.: J. A. Anderson, Supt. Lambertv., N. J.
R. McDowell, M. M. Lambertville, N. J.
Amboy Div.: I. S. Buckalew, Supt. Camden, N. J.
Thos. Kerr, M. M. So. Amboy, N. J.
P. S. Bogart, Gen. For. So. Amboy, N. J.
(3) West Jersey R. R. 4-9 g. 163 m. 22 lo. 342 cars.
Joseph Crawford, Supt. Camden, N. J.
W. McAllister, M. M. Camden, N. J.
C. C. Williams, Gen. For. Camden, N. J.
(4) Phila., Wilm. & Balt. R.R. 212 m. 86 lo. 1,488 c.
H. F. Kenney, Gen. Supt. Philadelphia, Pa.
S. A. Hodgman, M. M. Wilmington, Del.
W. H. Lungren, Gen. For. Wilmington, Del.
Cen. Div.: L. K. Lodge, Supt. Philadelphia, Pa.
S. D. Danfield, M. M. & C. B. Chester, Pa.
Del. Div.: I. N. Mills, Supt. Philadelphia, Pa.
(5) Phila. & Erie R. R. Divs.: 376 m. 117 lo. 3,481 c.
R. Neilson, Gen. Supt. Williamsport, Pa.
A. O. Dayton, Supt. Mo. Po. Williamsport, Pa.
E'n. Div.: Thos. Gucker, Supt. Williamsport, Pa.
Sun. H. & W. Div.: A. Walters, Supt.; and
W. F. Beardsley, M. M. Sunbury, Pa.
Mid. Div.: E. B. Westfall, Supt. Renova, Pa.
Wm. L. Holman, M. M. Renova, Pa.
West'n Div.: J. W. Reynolds, Supt. Erie, Pa.
W. T. Smith, M. M. Erie, Pa.
(6) Northern Central Ry. 4-9 g. 326 m. 152 lo. 6,163 c.
Robert Neilson, Gen. Supt. Williamsport, Pa.
A. O. Dayton, Supt. M. P. Williamsport, Pa.
A. W. Sumner, Pur. Agt. Baltimore, Md.
Susq. Div.: A. Walters, Supt. Williamsport, Pa.
Sham. Div.: Supt. Sunbury, Pa.
Elm. & Can. Divs.: S. Meade, Supt. Elmira, N. Y.
Jas. Strode, M. M. Elmira, N. Y.
J. C. Dyott, Gen. For. Elmira, N. Y.
Baltimore Div.: H. W. Knapp, Supt. Baltimore, Md.
(7) Balt. & Pot. & Alex. & Fred. 128 m. 29 lo. 356 c.
G. C. Wilkins, Gen. Supt. Baltimore, Md.
A. W. Sumner, Pur. Agt. Baltimore, Md.
J. M. Wallis, Supt. Mo. Po. Baltimore, Md.
J. M. Coale, M. M. Baltimore, Md.
G. W. Demarest, Gen. For. Baltimore, Md.

Penn. Coal Co.'s R. R. 4-3 g. 67 m. 23 eng. 2,871 c.
J. B. Smith, Gen. Supt. Dunmore, Pa.
And. Crane, M. M. Dunmore, Pa.
Geo. W. Simpson, M. C. B. Dunmore, Pa.
Pennsylvania & Erie R. R.—Early Branch.
C. R. Early, Gen. Supt. Ridgeway, Pa.
Pensacola & Perdido R. R. 6 g. 8 m. 5 lo. 73 cars.
B. F. Simmons, Pr. & Supt. Pensacola, Fla.
H. W. Simmons, Pur. Agt. Pensacola, Fla.
R. G. Nicholl, M. M. & C. B. Pensacola, Fla.
Peoria, Decatur & Evansville Ry.
4-8½ g. 254 m. 30 lo. 1,458 cars.
G. L. Bradbury, Gen. Man. Peoria, Ill.
P. Reilly, M. M. Mattoon, Ill.
Peoria & Farmington R. R. 4-8½ g. 25 m. 2 lo. 25 c.
D. P. Phelps, Gen. Man. Monmouth, Ill.
John F. Wallace, Supt. Farmington, Ill.
Peoria & Pekin Union Ry. 4-8½ g. 20 m. 12 lo. 100 c.
Thos. B. Burnett, Gen. Supt. & P. A. Peoria, Ill.
R. F. Hurd, M. M. & C. B. Peoria, Ill.
Perkiomen R. R. 4-8½ gauge 39 miles.
D. B. Clack, Supt. Perkiomen Junction, Pa.
Petersburg R. R. 4-8½ g. 64 m. 10 lo. 131 cars.
R. M. Sully, Gen. Supt. Petersburg, Va.
L. E. Clark, Pur. Agt. Petersburg, Va.
R. B. Andrews, M. M. Petersburg, Va.
J. W. Fleming, M. C. B. Petersburg, Va.
Phila., Wilmington & Balt. R. R. (See Penna. R. R.)
Phila. & Atlantic City Ry. 3-6 g. 54 m. 11 lo. 134 cars.
F. S. Urie, Supt. & Pur. Agt. Philadelphia, Pa.
John T. Keihner, M. M. Camden, N. J.
E. Lippincott, M. C. B. Camden, N. J.
Phila. & Reading. 4-8½ g. 486 m. 539 lo. 24,606 cars.
John E. Wootten, Gen. Man. Philadelphia, Pa.
W. S. Wilson, Pur. Agt. Philadelphia, Pa.
Geo. Eltz, Supt. Trans. Reading, Pa.
L. B. Paxson, Eng. of Mach. Reading, Pa.
No. Pa. & B. Brk. Div.:
I. A. Sweigard, Supt. Philadelpnia, Pa.
Mah. & Sham. Br.:
J. H. Olhausen, Supt. Mahoney Plane, Pa.
Cat. & Willp't. Br.:
D. C. Reinhart, Supt. Williamsport, Pa.
M. Hill & S. Haven Br.:
A. A. Hesser, Supt. Cressona, Pa.
Sch. & Sus. Br.:
H. H. Tracy, Supt. Pine Grove, Pa.
Read. & Col. Br.:
A. M. Wilson, Supt. Columbia, Pa.
Pittsburg, Bradford & Buffalo Ry. 3 g. 31 m. 4 lo. 79c.
J. M. Dickey, Gen. Man. Foxburg, Pa.
W. D. Reed, Supt. Foxburg, Pa.
Pittsburg, Cincinnati & St. Louis Ry. (See Penna. Co.)
Pittsburg, Ft. Wayne & Chicago Ry. (See Penna. Co.)
Pittsburg Southern Ry. 3 g. 38 m. 4 lo. 64 cars.
M. D. Hays, Supt. & P. A. Pittsburg, Pa.
W. S. Marshall, M. M. Pittsburg, Pa.
E. B. Gosline, M. C. B. Pittsburg, Pa.
Pitts. & Castle Shannon R. R. 3-4 g. 9 m. 5 lo. 388 c.
James M. Bailey, Gen. Supt. Pittsburg, Pa.
Holmes Ward, M. M. Castle Shannon, Pa.
Wm. E. Long, M. C. B. Pittsburg, Pa.
Pitts. & Lake Erie R. R. 4-8½ g. 70 m. 31 lo. 1,688 c.
W. C. Quincy, Gen. Man. Pittsburg, Pa.
R. W. Jones, Mast. Trans. Pittsburg, Pa.
S. W. Haines, M. M. Pittsburg, Pa.
Pittsburg & Western R. R. 3 g. 47 m. 2 lo. 76 cars.
E. K. Hyndman, Gen. Man. Pittsburg, Pa.
C. P. Ford, Pur. Agt. Allegheny, Pa.
W. L. Hofecker, M. M. Zelienople, Pa.
Port Huron & No.-Western Ry. 3 g. 105 m. 4 lo. 66 c.
H. McMorran, G. Man. & P. A. Port Huron, Mich.
I. R. Wadsworth, Supt. Port Huron, Mich.
Chas. Deifenbaugh, M. M. Port Huron, Mich.
Benj. Hillier, M. C. B. Port Huron, Mich.
Port Royal & Augusta Ry. 5 g. 112 m. 13 lo. 235 c.
J. N. Bass, Supt. Augusta, Ga.
John McCann, M. M. Augusta, Ga.
J. H. Milton, M. C. B. Augusta, Ga.
Portland & Ogdensburg. 4-8½ g. 114 m. 11 lo. 289 c.
J. Hamilton, Gen. Supt. & P. A. Portland, Me.
Geo. H. Poor, M. M. Portland, Me.
W. G. Brewer, M. C. B. Portland, Me.
Portland & Rochester R. R. 4-8½ g. 52 m. 7 lo. 230 c.
J. W. Peters, Supt. & Pur. Agt. Portland, Me.
E. H. C. Tompson, For. of Mach. Portland, Me.
David Dow, For. of Car Repairs Portland, Me.
Potomac, Fred.'g & Pied. R. R. 3 g. 38 m. 2 lo. 38 c.
Will M. Grafton, Supt. Fredericksburg, Va.
Pough., Hart. & Bos. R. R. 4-8½ g. 45 m. 4 lo. 64 c.
J. A. Perkins, Supt. Poughkeepsie, N. Y.
John L. Donaldson, M. M. Poughkeepsie, N. Y.
Prince Edward Island Ry. 3-6 g. 199 m. 17 lo. 280 c.
L. B. Archibald, Supt. & Pur. Agt.;
Jos. Unsworth, M. Supt. & Storekeeper; and
D. M. Fraser, M. C. B. Charlottetown, P. E. I.
Prov., Warren & Bristol R. R. 4-8½ g. 19 m. 5 lo. 38 c.
Waterman Stone, Supt. Providence, R. I.
Rufus Smith, M. M. & C. B. Bristol, R. I.
Prov. & Springfield R. R. 4-8½ g. 23 m. 3 lo. 83 c.
Wm. Tinkham, Gen. Man. Providence, R. I.
G. T. Richardson, M. M. Providence, R. I.
Prov. & Worcester. 4-8½ g. 66 m. 30 lo. 858 c.
W. E. Chamberlain, Supt. Providence, R. I.
A. Griggs, Supt. L. & C. D. Providence, R. I.
Pullman's Palace Car Co. 472 passenger cars.
A. B. Pullman, 2d V.-Pr. & G. M. Chicago, Ill.
Geo. F. Brown, Gen. Supt. Chicago, Ill.
Wm. A. Angell, Pur. Agt. Chicago, Ill.
S. W. Bretzfield, Asst. Pur. Agt. New York, N. Y.
A. Rapp, Man. (Chicago Works) Chicago, Ill.
H. L. Spaulding, Man. (Det Shops) Detroit, Mich.
E. A. Benson, Supt. Shops St. Louis, Mo.

Q

Quebec Central Ry. 4-8½ g. 139 m. 3 lo. 79 cars.
A. Steele, Supt. Sherbrooke, Que.
R. D. Morkill, Pur. Agt. Sherbrooke, P. Q.
Jas. Seiveright, M. M. Sherbrooke, P. Q.
Quebec & Lake St. John Ry. 4-8½ g. 24 m. 3 lo. 43 c.
J. G. Scott, Manager Quebec, Can.
Frank Fournier, Supt. St. Raymond, P. Q.
John T. Eames, M. M. St. Raymond, P. Q.

R

Raleigh & Augusta Air-Line: Carolina Central,
Raleigh & Gaston R. Rs. 4-8½ g. 436 m. 47 lo. 994 c.
John C. Winder, Gen. Man. & P. A. Raleigh, N. C.
Raleigh Rds. 4-8½ g. 194 m. 21 lo. 563 cars.
B. R. Harding, Supt. of Mach. Raleigh, N. C.
Carolina Cen. R. R. 4-8½ g. 242 m. 26 lo. 431 c.
V. Q. Johnson, Gen. Supt. Wilmington, N. C.
James Maglenn, M. of Mach. Laurinburg, N. C.
S. R. Ethridge, M. C. B. Laurinburg, N. C.
Rensselaer & Saratoga R. R. (See Del. & Hud. Can. Co.)
Rhinebeck & Connecticut. (See Hart. & Ct. W'n.)
Richmond, Fredericksburg & Potomac R. R.
4-8½ g. 83 m. 14 lo. 137 cars.
E. T. D. Myers, Gen. Supt. Richmond, Va.
T. L. Courtney, Asst. Supt. Richmond, Va.
H. Kuhn, M. M. Richmond, Va.
W. H. Trainham, M. C. B. Richmond, Va.
Richmond & Alleghany R. R. 4-9 g. 260 m. 19 lo. 837c.
Decatur Axtell, V. P. & Gen. Man. Richmond, Va.
Geo. W. Agee, Supt. Richmond, Va.
M. Sweeney, Pur. Agt. Richmond, Va.
Geo. D. Harris, M. M. & C. B. Richmond, Va.
Richmond & Danville R. R. Co.'s Roads.
1,718 miles 218 loco. 3,616 cars.
T. M. R. Talcott, Gen. Man. Richmond, Va.
J. P. Minetree, Pur. Agt. Richmond, Va.
R. D. Wade, Supt. Mo. Po. Richmond, Va.
(1) Rich. & Dan. R. R. 5 g. 829 m. 131 lo. 2,480 cars.
Peyton Randolph, As. G. Man. Richmond, Va.
Rich. & Dan. Div.: 5 g. 320 m. 80 lo. 1,797 c.
Wm. H. Green, Supt. Richmond, Va.
T. W. Gentry, M. M. Richmond, Va.
J. B. Vaughan, For. Car Sh. Richmond, Va.
North Carolina Div. 5 g. 223 m. 22 lo. 268 cars.
A. B. Andrews, Supt. Raleigh, N. C.
W. H. Turrentine, M. M. Comp'y's Shops, N. C.
J. C. Holt, For. Car Sh. Comp'y's Shops, N. C.
Atlanta & Char. Air Line. 5 g. 286m. 31 lo. 415 c.
Narrow Gauge Branches. 3 g. 80 m. 5 lo. 37 c.
I. Y. Sage, Supt. Atlanta, Ga.
W. A. Walden, M. M. Atlanta, Ga.
Z. T. Smith, For. Car Sh. Atlanta, Ga.

(2) Charlotte, Col.& Aug. R. R. 5g. 239 m. 22 lo. 287 c.
G. R. Talcott, Supt..........Columbia, S. C.
J. H. Green, M. M. (2 roads)...Columbia, S. C.
J. H. Perkins, For. Car Sh....Columbia, S. C.
(3) Columbia & Greenville R. R. 5 g. 297 m. 22 l. 218 c.
J. W. Fry, Supt..............Columbia, S. C.
J. O. Meredith, For. E.& C. Rep.. do.
(4) Virginia Midland Ry. 4-8½ g. 353 m. 41 lo. 631 c.
W. M. S. Dunn, Eng. & Supt. Alexandria, Va.
J. E. Waddey, M. of M......Alexandria, Va.
J. T. Nails, M. C. B.......Alexandria, Va.
Richmond & Petersburg R.R. 4-8½ g. 25 m. 8 lo. 130 c.
J. R. Kenly, Supt.............Richmond, Va.
John O'Brien, M. M............Richmond, Va.
Rio Grande R. R. 3-6 g. 22 m. 3 lo. 39 cars.
M. J. Gomila, Rec. & Gen. Man Brownsville, Tex.
G. W. Rendall, M. M.........Brownsville, Tex.
M. Markwood, M. C. B.......Brownsville, Tex.
Rochester & Pittsb'g. R.R. 4-8½ g. 134 m. 11 lo. 612 c
Geo. E. Merchant, Gen. Man...Rochester N. Y.
J. P. Hovey, M. M...........Rochester, N. Y.
Rock Island & Mercer County R. R., and
Rock I'd & Peoria Ry. 4-8½ g. 113 m. 12 lo. 357 c.
R. R. Cable, V.-P. & Gen. Supt..Rock Island, Ill.
R. I. & P. Ry.: H. B. Sudlow, Supt. & P. A. do.
Joseph Elder, M. M..............Peoria, Ill.
R. I. & M. C. Rd.: B. T. Cable, Supt. R'k Island, Ill.
J. H. Parks, M. M............Rock Island, Ill.
Rome (Ga.) R. R. 5 g. 20 m. 2 lo. 13 cars.
Eben Hillyer, Supt...............Rome, Ga.
O. W. Harbin, M. M. & C. B.........Rome, Ga.
Rome, Watertown & Ogdensburg R. R.
4-8½ g. 409 m. 51 lo. 1,400 cars.
E. A. Van Horne, Gen. Supt......Oswego, N. Y.
Geo. W. B. Cushing, Pur. Agt. New York, N. Y.
Geo. H. Haselton, M. M. & C. B..Oswego, N. Y.
Rumford Falls & Buckfield R.R. 4-8½ g. 29 m. 2 l. 42 c.
O. Hayford, Supt.................Canton, Me.
O. Spaulding, Pur. Agt...........Buckfield, Me.
E. R. Oldham, M. M.............Buckfield, Me.

S

Sabine & East Texas Ry. 4-8½ g. 104 m. 5 lo. 333 c.
R. H. Cousins, Gen. Supt......Beaumont, Tex.
W. A. Meagher, M. M..........Beaumont, Tex.
Sacramento & Placerville R. R. 4-8½ g. 49 m. 3 lo. 68 c.
J. B. Wright, Supt. & P. A....Sacramento, Cal.
A. J. Stevens M. M...........Sacramento, Cal.
Benj. Welch, M. C. B.........Sacramento, Cal.
Saginaw Bay & Northw'n R. R. 4-8½ g. 30 miles.
J. Jackson, Gen. Man.......Pinconning, Mich.
F. T. Lillote, Act. Pur. Agt...Pinconning, Mich.
Edward Keeler, M. M........Pinconning, Mich.
Saginaw Valley & St. Louis R. R. 4-8½ g. 35 m. 4 l. 64 c
N. W. Merrill, Supt...............Saginaw, Mich.
Allan Bourn, Pur. Agt.............Detroit, Mich.
Geo. C. Watrous, M. M................Iona, Mich.
San Francisco & No. Pac. 4-8½ g. 112 m. 11 lo. 244 c.
Arthur Hughes, Gen. Man..San Francisco, Cal.
H. C. Whiting, Supt..............Petaluma, Cal.
M. C. B..............Donahue, Cal.
Savannah, Florida & W'n Ry. 5 g. 422 m. 50 lo. 695 c.
H. S. Haines, Gen. Man.........Savannah, Ga.
R. G. Fleming, Supt...........Savannah, Ga.
F. S. Pendergast, Eng. & Asst. Supt. Savannah, Ga.
A. A. Aveilhé, Pur. Agt.........Savannah, Ga.
James D. Hollister, M. of Mach..Savannah, Ga.
G. M. D. Riley, For. Loco. Dept...Savannah, Ga.
Jos. W. Rowell, For. Car Dept Savannah, Ga.
Sav., Griffin & No. Ala. R. R. Op. by Central (Ga.).
Schuylkill & Lehigh R. R. 4-8½ g. 43 miles.
Eldredge Dale, Supt...............Reading, Pa.
Scoharie Valley R. R. (See Middleburg & Sch.)
Scioto Valley R. R. 4-8½ g. 131 m. 15 lo. 460 cars.
Geo. Skinner, Supt...............Columbus, O.
R. Bromley, M. M. & P. A......Portsmouth, O.
Seaboard & Roanoke R. R. 4-8½ g. 80 m. 21 lo. 381 c.
E. G. Ghio, Mast. of Trans....Portsmouth, Va.
M. M. Pendleton, S. M. P. & M. Portsmouth, Va.
Shenandoah Valley R. R. 4-8½ g. 143 m. 15 lo. 104 c.
Henry Fink, Gen. Man........Lynchburg, Va.
J. H. Sands, Supt..................Roanoke, Va.
W. C. De Armond, Pur. Agt. Philadelphia, Pa.
Chas. Blackwell, Supt. of M. P..Roanoke, Va.
W. Welch, M. M....................Roanoke, Va.
Shenango & Allegheny R.R. 4-9½ g. 47 m. 6 lo. 156 c.
J. T. Blair, G. Supt. & Pur. Agt. Greenville, Pa.
Edw. Richardson, M. M. & C. B. Greenville, Pa.
Shepaug R. R. 4-8½ g. 38 m. 3 lo. 27 cars.
Edwin McNeill, Supt.............Litchfield, Ct.
C. M. Allen, M. M...............Litchfield, Ct.
Ship Is., Ripley & Ky. R. R. 3 g. 25 m. 2 lo. 23 cars.
C. L. Harris, Supt. & Pur. Agt....Ripley, Miss.
W. H. Phelps, M. M.................Ripley, Miss.
Sioux City & Pacific R. R. 4-8½ g. 427 m. 21 lo. 594 c.
P. E. Hall, Gen. Man. & P. A. Cedar Rapids, Ia.
C. M. Lawler, Gen. Supt....Missouri Valley, Ia.
J. S. Wattles, Supt.........Missouri Valley, Ia.
C. F. McCoy, Asst. Supt..............Blair, Neb.
S. A. Teal, M. M..............Missouri Valley, Ia.
W. H. Ramseyer, M. C. B...Missouri Valley, Ia.
Sodus Bay & Southern Ry. 4-8½ g. 34 m. 4 lo. 40 c.
S. B. Stuart, Supt. & Pur. Agt. Sodus Point, N. Y.
C. H. Hill, M. C. B..........Sodus Point, N. Y.
South Carolina Ry. 5 g. 243 m. 42 lo. 685 cars.
John B. Peck, Gen. Man.......Charleston, S. C.
S. B. Pickens, Pur. Agt........Charleston, S. C.
P. J. Cochrane, Mast. of Mach. Charleston, S. C.
Geo. H. Gramling, M. C. B....Charleston, S. C.
South-Eastern Ry. 4-8½ g. 260 m. 26 lo. 826 cars.
Bradley Barlow, Gen. Man......Montreal, Can.
T. A. McKinnon, Asst. Man.....Montreal, Can.
H. A. Alden, Supt..................Richford, Vt.
A. G. Eastman, M. M..............Richford, Vt.
South Florida R. R. 3 gauge 40 m. 4 lo. 20 cars.
B. R. Swoope, Supt. & P. A.........Sanford, Fla.
C. C. Haskell, Pur. Agt.............Sanford, Fla.
J. A. Campbell, M. M...............Sanford, Fla.
A. D. Stentiford, M. C. B..........Sanford, Fla.
South Mountain R. R. 4-8½ g. 18 m. 4 lo. 22 c.
W. H. Woodward, Supt. Pine G've Furnace, Pa.
South Pacific Coast R. R. 3 g. 81 m. 10 lo. 260 cars.
A. H. Fracker, Gen. Supt..San Francisco, Cal.
G. H. Waggoner Pur. Agt..San Francisco, Cal.
E. L. Reese, M. M. & C. B.........Newark, Cal.
South-Western R. R. (Ga.) (See Central of Ga.)
South-Western Ry. (Ky.) 4-8½ g. 4 m. 1 lo. 38 cars.
J. M. Wilson, Supt............Harrodsburg, Ky.
J. Tomlinson, Pur. Agt.......Harrodsburg, Ky.
Southern Central R. R. 4-8½ g. 115 m. 16 lo. 447 c.
James G. Knapp, Supt. & Pur. Agt. Auburn, N. Y.
Chas. G. Brown, M. M..............Auburn, N. Y.
H. Mooney, M. C. B..................Auburn, N. Y.
Southern Maryland R. R. 4-8½ g. 20 m. 1 lo. 5 c.
Robert Knight, Supt..........Brandywine, Md.
C. R. Joyce, M. M..............Brandywine, Md.
Southern Pacific R. R. 4-8½ g. 198 m. 30 lo. 728 c.
Northern Div. (For other Divs. see Cen. Pac.)
A. C. Bassett, Supt.......San Francisco, Cal.
J. R. Watson, Pur. Agt.....Sacramento, Cal.
J. T. Wilson, M. M.......San Francisco, Cal.
F. N. Bellisle, M. C. B....San Francisco, Cal.
Springfield, Effingham & So.-E. and Bloomfield Rys.
3 g. 89 m.
W. C. Lyon, Gen. Man. & Pur. Agt. Robinson, Ill.
J. S. Pickering, M. M. & C. B... Effingham, Ill.

Spring Hill & Parrsboro Ry. 4-8½ g. 32 m. 1 lo. 64 c.
J. A. Killam, Gen. Man........Parrsboro, N. S.
K. McKinnon, M. M..............Parrsboro, N. S.
St. Croix & Penobscot R. R. 4-8½ g. 22 m. 4 lo. 195 c.
S. W. Haycock, Supt. & Pur. Agt. .Calais, Me.
G. H. Corsen, M. M....................Milltown, Me.
H. C. Tincker, M. C. B..............Milltown, Me.
St. John & Maine Ry. 4-8½ g. 92 m. 9 lo. 146 cars.
H. D. McLeod, Supt. & P. Agt...St. John, N. B.
Andrew Davis, M. M..............St. John, N. B.
St. John's Ry. 4-8½ g. 14½ m. 2 lo. 24 cars.
R. McLaughlin, Pr. & Supt. .Jacksonville, Fla.
Geo. Ferro, M. of Mach....................Tocoi, Fla.
St. Johnsb'ry & Lake Champ 4-8½ g. 120 m 10 lo. 297 c.
A. B. Jewett, Supt. & P. A..St. Johnsbury, Vt.
Geo. E. Howe, M. M. & C. B. St. Johnsbury, Vt.
St. Joseph & Des Moines R. R. (See K. C., St. J. & C. B.)
St. Lawrence & Ottawa Ry. 4-8½ g. 59 m. 10 l. 146 c.
Archer Baker, Gen. Supt..........Montreal, Ont.
R. Blackwell, Mech. Supt..........Montreal, Ont.
St. Louis, Alton & Terre Haute R. R.
Main Line. (See Ind. & St. L. Div.: Ohio Ry.)
St. Louis & Cairo Div.: 4-8½ g 137 m. 17 lo. 778 c.
G. W. Parker, Gen. Man.......St. Louis, Mo.
J. L. Hinckley, Supt..............Belleville, Ill.
A. M. De Clerq, M. M..........St. Louis, Mo.
St. Louis Bridge Co. and Tunnel R. R.
4-8½ g. 27 m. 18 lo. 11 cars.
Wm. Taussig, Gen. Man..........St. Louis, Mo.
A. W. Dickinson, Supt.............St. Louis, Mo.
J. E. Williams, Jr., Pur. Agt....St. Louis, Mo.
H. M. Smith, M. M...................St. Louis, Mo.
St. Louis Coal R. R. 4-8½ g. 28 m. 1 lo. 78 cars.
Jas. Prentice, Supt................Carbondale, Ill.
Jas. C. Bryden, Pur. Agt..........St. Louis, Mo.
St. Louis, Ft. Scott & Wichita R. R. 4-8½ g. 20 miles.
F. Tiernan, V. P. & Gen. Man..Fort Scott, Kan.
J. W. Miller, Supt..............Fort Scott, Kan.
Henry Berger, M. M..............Ft. Scott, Kan.
A. A. Tiddell, M. C. B...........Ft. Scott, Kan.
St. L., Hannibal & Keokuk. 4-8½ g. 85 m. 5 lo. 65 c.
W. W. Walker, Gen. Supt.......Hannibal, Mo.
Geo. Douglass, Pur. Agt.........Hannibal, Mo.
St. Louis, Iron Mt. & So'n Ry. (See Mo. Pacific Ry.)
St. L. Keokuk & No.-W'n. 4-8½ g. 187 m. 14 lo. 312 c.
R. Law, Gen. Supt...................Keokuk, Ia.
G. B. Harris, Pur. Agt..............Chicago, Ill.
Wm. H. Bartlett, M. M...............Keokuk, Ia.
St. L., Salem & Little Rock. 4-9 g. 69 m. 5 lo. 103 c
H. A. Crawford, V. Pr. & P. A...St. Louis, Mo.
E. B. Sankey, Supt.....................Salem, Mo.
Thomas Everson, M. M...........Steelville, Mo.
J. W. Houston, M. C. B............Steelville, Mo.
St. L., Van. & T. H. (See T. H. & I. Div. of Penna. Co.)
St. Louis & Cairo R. R. 3 g. 152 m. 22 lo. 896 cars.
Chas. Hamilton, Gen. Supt......St. Louis, Mo.
R. M. Pringle, M. M...............St. Louis, Mo.
St. L. & San Fran. Ry. 4-8½ g. 854 m. 80 lo. 2,700 c.
C. W. Rogers, V. P. & Gen. Man..St. Louis, Mo.
D. H. Nichols, Mast. Tran..No. Springfield, Mo.
A. G. Thompson, Pur. Agt....... do.
M. Kearney, M. M. & C. B..No. Springfield, Mo.
Mo. & Ark. Div.: W. A. Thoms, Supt. do.
Kan. Div.: J. R. Wentworth, Supt. Neodesha, Kan.
St. Martin's & Upham Ry. 4-8½ g. 30 m. 2 lo. 8 cars.
A. E. Killam, Manager........St. Martin s, N. B.
St. Paul, Minneapolis & Manitoba Ry.
4-8½ g. 1,125 m. 168 lo. 4,331 cars.
A. Manvel, Gen. Man............St. Paul, Minn.
S. R. Stimson, Gen. Supt........St. Paul, Minn.
E. B. Wakeman, Asst. Gen. Supt. St. Paul, Minn.
J. C. Morrison, Pur. Agt........St. Paul, Minn.
H. Middleton, M. M. & C. B....St. Paul, Minn.
Breck. Div.: A. Guthrie, Supt..St. Paul, Minn.
F. F. Div.: J. B. Rice, Supt........St. Paul, Minn.
No'n Div.: D. K. Smith, Supt....Crookston, Minn.
St. Paul & Duluth R. R. 4-8½ g. 196 m 24 lo. 580 c.
H. P. Breed, Asst. Gen. Supt....St. Paul, Minn.
J. G. Callahan, Pur. Agt.........St. Paul, Minn.
W. McFarland, M. M...............St. Paul, Minn.
John Hill, M. C. B..................St. Paul, Minn.
Sterling Mountain Ry. 6 g. 8 m. 2 lo. 145 cars.
J. C. Missimer, Supt...........Sloatsburg, N. Y.
Syracuse, Binghamton & N. Y. R. R. (See D. L. & W.)
Syracuse, Chenago & N. Y. 4-8½ g. 44 m. 4 lo. 60 c.
Albert Allen, Supt.................Syracuse, N. Y.
George W. West, M. M.........Syracuse, N. Y.
Wm. J. McMichael, M. C. B... Syracuse, N. Y.
Syracuse, Geneva & Corning; Corning, Cowanasque & Antrim R. Rs. 4-8½ g. 121 m. 28 lo. 1,044 c.
A. H. Gorton, Supt...............Corning, N. Y.
W. E. Gorton, Asst. Supt........Corning, N. Y.
Andrew Beers, Pur. Agt.........Corning, N. Y.
O. C. Patchell, M. M..............Corning, N. Y.
C. J. Butler, M. C. B..............Corning, N. Y.

T

Terre Haute & So.-Eastern Ry. 4-9 g. 40 miles.
Geo. Atherton, Supt........Terre Haute, Ind.
Texas-Mexican; and Mexican National Rys.
3 g. 333 m. 28 lo. 600 cars.
G. C. Gardner, Gen. Man....New York, N. Y.
R. C. Peebles, Supt...............Mexico, Mex.
J. Dougherty, Pur. Agt.....New York, N. Y.
Gen. Supt....Corpus Christi, Tex.
P. J. Milan, M. M. & C. B. do.
Mex. Nat. Ry.: J. C. Monroe, M. M..Mexico, Mex.
Jno. Scullen, Gen. Man...........Mexico, Mex.
Texas Western Ry. 3 g. 42 m. 2 lo. 34 cars.
J. W. Goodwin, Supt...............Houston, Tex.
T. F. Glispin, M. M.................Houston, Tex.
Texas & New Orleans; Louisiana W'n R. Rs.
4-8½ g. 217 m. 25 lo. 900 c.
J. F. Crosby, Gen. Man.........Houston, Tex.
P. B. Watson, Pur. Agt..........Houston, Tex.
C. A. Burton, Supt.................Houston, Tex.
D. C. Smith, M. M...................Houston, Tex.
J. M. Mather, M. C. B............Houston, Tex.
Texas & Pacific. (See Mo. Pac. Ry.)
Texas & St. Louis Ry. 3 g. 304 m. 19 lo. 338 cars.
G. W. Ristine, Gen. Man.......St. Louis, Mo.
J. B. Van Dyne, Gen. Supt.........Tyler, Tex.
F. W. Paramore, Pur. Agt.......St. Louis, Mo.
L. B. Fish, Pur. Agt.................Tyler, Texas.
W. J. Lewis, M. M. & C. B..........Tyler, Tex.
Tioga and Elmira State Line R. Rs.
4-8½ and 6 g. 54 m. 17 lo. 953 cars.
L. H. Shattuck, Supt..............Blossburg, Pa.
J. A. Hardenburg, Pur. Agt...New York, N. Y.
Pere Bonny, M. M..................Blossburg, Pa.
D. H. Stratton, M. C. B..........Blossburg, Pa.
Toledo, Ann Ar. & Gr. Tr. Ry. 4-8½ g. 84 m. 9 lo. 150 c.
J. M. Ashley, Gen. Man......Ann Arbor, Mich.
H. W. Ashley, Supt. & Pur. Agt. do
C. C. Dodge, M. M...........Ann Arbor, Mich.
Toledo, Cin. & St. Louis R. R. 3 g. 465 m. 63 lo. 2,200 c.
Gen. Man.............Toledo, O.
J. H. F. Wiers, Supt. Mach. & P. Agt. Toledo, O.
Toledo Div.: W. N. Moffatt, Supt.; and
J. G. Clifford, M. M..................Delphos, O.
C. H. Mead, Gen. M. C. B.........Delphos, O.
S.-E'n & Dayton Div.: D. T. Bacon, Supt. Dayton, O.
L. Parisoe, M. M.......................Dayton, O.
Tonawanda Valley & Cuba and Bradford, Eldred & Cuba R. Rs. 3g. 19 m. 1 lo. 13 cars.
Supt. & Pur. Agt.....Cuba, N. Y.

Toronto, Grey & Bruce Ry. 4-8½ g. 191 m 20 lo 446 c.
Edmund Wragge, Gen. Man....Toronto, Can.
W. Watson, Pur. Agt..........Toronto, Can.
David Preston, M. M...........Toronto, Can.
Troy & Boston R. R. 4-8½ g. 48 m. 20 lo. 484 cars.
D. Robinson, Pres. & Pur. Agt......Troy, N. Y.
Joseph Crandell, Supt...............Troy, N. Y.
Z. B. Davis, M. M......................Troy, N. Y.
R. V. Coon, M. C. B..................Troy, N. Y.
Tuckerton R. R. 4-8½ g. 31 m. 2 lo. 28 cars.
J. J. Pharo, Supt...............Tuckerton, N. J.

U

Ulster & Delaware R. R. 4-8½ g. 74 m. 10 lo. 214 cars.
Jas. H. Jones, Supt..............Rondout, N. Y.
Joseph Rusb, M. M...............Rondout, N. Y.
John H. Decker, M. C. B.........Rondout, N. Y.
Union Pacific Ry. (4 Gen. Divs.)
3 & 4-8½ g. 4,270 m. 318 lo. 6,157 cars.
S. H. H. Clark, Gen. Man.........Omaha, Neb.
Thos. L. Kimball, Asst. Gen Man. Omaha, Neb.
M. H. Goble, Pur. Agt...............Omaha, Neb.
I. H. Congdon, Gen. M. M..........Omaha, Neb.
Geo. E. Stevens, Supt. Car Dept. Omaha, Neb.
(1) Neb. Div.: P. J. Nichols, Gen. Supt..Omaha, Neb.
Robt. McConnell, M. M........Omaha, Neb.
A. M. Collett, M. C. B...........Omaha, Neb.
Jas. H. McConnell, M. M.....No. Platte, Neb.
A. Reis, For. Car. Sh.........No. Platte, Neb.
T. A. Davies, M. M..........Cheyenne, Wy. T.
J. E. Davies, For. Car. Sh..Cheyenne, Wy. T.
(2) Col. Div.: A. A. Egbert, Gen. Supt....Denver, Col.
Fred. Metzheimer, M. M..........Golden Col.
E. G. Thomas, For. Car. Sh......Golden, Col.
D. & S. P. Div.: J. H. Kirk, M. M....Denver, Col.
(3) Wy. Div.: Edw. Dickinson, G. Supt. Laramie, Wy. T.
R. Galbraith, M. M..............Laramie, Wy. T.
R. M. Galbraith, M. M.......Rawlins, Wy. T.
Frank Blake, For. Car. Sh...Rawlins, Wy. T.
Geo. F. Chapman, M. M.....Evanston, Wy. T.
R. V. Brinkley, For. Car. Sh. Evanston, Wy. T.
Idaho Div.: W. B. Doddridge, Gen. Supt. Ogden, U.
R. Craft, M. M.............................Logan, U.
F. Reardon, M. M..........Eagle Rock, Idaho.
F. M. Shoemaker, For. Car. Sh. Eagle R'k, Ida.
(4) Kansas Div.: S. T. Smith, G. Supt. Kansas C'y, Mo.
Jno. Mackenzie, Supt. Mach. Armstrong, Kan.
T. B. Roberts, M. C. B....Armstrong, Kan.
K. Val. Div.: J. O. Brinkerhoff, Supt. Kan. C'y, Mo.
Jas. Mackenzie, M. M......Armstrong, Kan.
Smoky Hill & Denver Divs.:
O. H. Dorrance, Supt.........Wallace, Kan.
J. B. Dailey, M. M. (S. H. Div.).....Ellis, Kan.
Chey. Div.: A. A. Egbert, Supt..... Denver, Col.
R. McDougall, M. M. (D.& C. Divs.) Denver, Col.
W. Ogle, For. Car. Sh. (D.& C. Divs.) do.
(5) St. J. & W'n. Rd.: L. D. Tuthill, Supt. St. Joseph, Mo.
E. Sleppy, M. M..........Grand Island, Neb.
E. Hansen, For. Car. Sh.......Elwood, Kan.
(6) Kan. Cen. Div.: 3 g. 150 miles.
W. J. Kelley, Supt......Leavenworth, Kan.
And. Goldthwaite, M. M..Leavenworth, Kan.
J. P. Newman, M. C. B...Leavenworth, Kan.
(7) Nevada Central Ry. 3 g. 93 m. 5 lo. 82 cars.
F. W. Dunn, Supt........Battle Mountain, Nev.
Z. T. Spriggs, M. M.....Battle Mountain, Nev.
United States Rolling Stock Co. 23 lo. 4,834 cars.
A. Hegewisch, Pres............New York, N. Y.
C. F. Jauriet, Gen. M. M...........Chicago, Ill.
W. H. Chaddock, Pur. Agt.........Chicago, Ill.
Utah Central Ry. 4-8½ g. 280 m.
John Sharp, Gen. Supt...Salt Lake City, Utah.
S. H. Hill, Pur. Agt.......Salt Lake City, Utah.
W. B. Armstrong, M. M..Salt Lake City, Utah.
Peter Reid, M. C. B.......Salt Lake City, Utah.
Utah & Nevada Ry. 3 g. 37 m.
W. W. Ritter, Gen. Man...Salt Lake City, Utah.
Robert Anderson, M. M...Salt Lake City, Utah.
Utah & Pleasant Valley Ry. 60 m.
G. M. Young, Man........Salt Lake City, Utah.
Utica, Ithaca & Elmira Ry. 4-8½ g. 120 m. 11 lo. 152 c.
C. R. Fitch, Supt...................Elmira, N. Y.
Geo. W. Cleveland, M. M......Breesport, N. Y.
Wm. Ells, M. C. B................Breesport, N. Y.
Utica, & Black Riv. R. R. 4-8½ g. 180 m. 22 lo. 329 c.
J. F. Maynard, Gen. Supt. & P. A..Utica, N. Y.
John Bailey, M. M.....................Utica, N. Y.
David James, M. C. B...............Utica, N. Y.

V

Vaca Vall. & Clear Lake R. R. 4-8½ g. 30 m. 2 lo. 19 c.,
G. B. Stevenson, Gen. Supt.....Vacaville, Cal.
Valley Ry. 4-8¾ g. 59 m. 10 lo. 317 cars.
J. E. Tusk, Supt. & P. Agt....... Cleveland, O.
Chas. Blanchard, M. C. B.........Cleveland, O.
Vernon, Greensburg & Rushville R. R. 25 m.
Horace Scott, V.-Pres.........Greensburg, Ind.
Virginia Midland Ry. (See Rich. & Dan.)
Virginia & Truckee R. R. 4-8½ g. 54 m. 17 lo. 375 c.
Carson & Colorado R. R. 3 g. 158 m. 4 lo. 76 c.
H. M. Yerington, Gen. Supt..... Carson, Nev.
R. J. Laws, Supt. (C. & Col.).......Carson, Nev.
C. P. Mason, Pur. Agt..............Carson, Nev.
I. N. Fording, M. M..................Carson, Nev.
B. F. Lyon, M. C. B...................Carson, Nev.

W

Wabash, Chester & W'n R. R. 4-8½ g. 42 m. 2 lo. 32 c
J. L. Hinckley, Gen. Supt..........Chester, Ill
Wabash, St. Louis & Pacific Ry. (3 Gen. Divs.)
4-8½ g. 3,241 m. 598 lo. 17,230 cars.
John C. Gault, 2d V. P.............St. Louis, Mo.
Robert Andrews, Gen. Supt.....St. Louis, Mo.
W. S. Lincoln, Pur. Agt...........St. Louis, Mo.
Jacob Johann, Gen. M. M......Springfield, Ill.
U. H. Kohler, Gen. M. C. B..........Toledo, O.
(1) Eas'n Div.: J. B. Barnes, M. M. Fort Wayne, Ind.
Oh. & Ind. Div.: G. W. Stevens, Supt. Ft. Wayne, Ind.
Peru Div.: E. C. Murphy, Supt.............Peru, Ind.
John McKenna, M. M....................Peru, Ind.
Cairo Div.: D. G. Moore, Supt..............Cairo, Ill.
W. S. Morris, M. M........................Carmi, Ill.
(2) Middle Div.: R. M. Hemphill, M. C. B. Peoria, Ill.
Ill. Div.: H. F. Clark, Supt.........Springfield, Ill.
B. B. Rose, M. C. B..................Decatur, Ill.
Chicago Div.: E. N. Armstrong, Supt. Chicago, Ill.
Peoria Div.: F. L. Tomkins, Supt.......Peoria, Ill.
Rant'l Div.: B. F. Mathias, Supt.......Rantoul, Ill.
J. McCarthy, M. M......................Rantoul, Ill.
(3) Western Div.: W. H. Selby, M. M...Moberly, Mo.
C. S. Buck, M. C. B.........................Moberly, Mo.
Missouri Div.: R. S. Miner, Supt. ..Moberly, Mo.
C. B & O. Div.: J. W. Blanchard, Supt.; and
J. S. Hazen, M. C. B..................Stanberry, Mo.
Quincy Div.: F. D. Schermerhorn, S..Quincy, Ill.
Iowa Div.: E. Dresser, Supt...............Keokuk, Ia.
D. Moin. Div.: H. B. Skeele, Supt..Des Moines, Ia.
Walla Walla & Columbia Riv. R. R. (See Ore. Ry)
Walkill Ry. (See N. Y., West. Sh. & B.
Washington & Western R. R. 4-8½ g. 52 m. 5 lo. 83 c.
H. McLean, Gen. Supt.........Alexandria, Va.
Edward Dunn, M. M...............Alexandria, Va.
John Harrison, M. C. B..........Alexandria, Va.
Waynesburg & Washington Rd. 3 g. 28 m. 3 lo. 15 c.
C. E. Bower, Supt...................Waynesburg, Pa.
A. M. Kline, M. C. B...............Waynesburg, Pa.
Welland Ry. 4-8½ g. 25 m. 3 lo. 147 cars
William Pay, Supt............St. Catharines, Ont.

Jas. Taylor, M. M.............St. Catharines, Ont.
Wm. H. Pay, M. C. B.........St. Catharines, Ont.
West End Narrow Gauge Ry. 3 g. 16 m.
Rolla Wells, Supt.....................St. Louis, Mo.
M. M. Hodgman, M. M...........Florissant, Mo.
West Feliciana R. R. 4-8½ g. 27 m. 2 lo. 22 cars.
J. B. McGehee, Pr. & Gen. Supt. Bayou Sara, La.
J. A. Tilton, M. M. & C. B.....Bayou Sara, La.
West Virginia, Central & Pittsb'g Ry. 15 m 3 lo. 19 c.
W. E. Porter, Gen. Supt......Piedmont, W. Va.
W. T. Blackiston, Pur. Agt....Piedmont, W. Va.
E. W. Lippencott, M. M. & M. C. B..Piedmont.
Western R. R. (of Ala.) 5 g. 88 m. 15 lo. 270 cars.
Atlanta & W. Point Rd. 5 g. 87 m. 14 lo. 20 c.
Cecil Gabbett, Gen. Man. & Supt...Mont., Ala.
C. D. Wall, M. M..................Montgomery, Ala.
F. M. Wade, M. C. B.............Montgomery, Ala.
Western Counties' Ry. 4-8½ g. 67 m. 8 lo. 137 cars.
J. Brignell, Supt.....................Yarmouth, N. S.
Western Maryland R. R. 4-8½ g. 157 m. 16 lo. 394 c.
J. M. Hood, Pr. & Gen. Man....Baltimore, Md.
R. J. Adair, Pur. Agt...............Baltimore, Md.
David Holtz, Mast. of Mach. Union Bridge, Md.
J. H. Nussear, M. C. B.......Union Bridge, Md.
Western No. Carolina R. R. 5 g. 155 m. 6 lo. 36 c.
V. E. McBee, Supt.................Salisbury, N. C.
Jos. P. Minetree, Pur. Agt.......Richmond, Va.
G. W. Gates, M. M.................Salisbury, N. C.
Western & Atlantic R. R. 5 g. 138 m. 48 lo. 952 c.
R. A. Anderson, Gen. Supt.........Atlanta, Ga.
A. B. Bostwick, Asst. Supt.........Atlanta, Ga.
W. R. Webster, Pur. Agt............Atlanta, Ga.
John H. Flynn, M. M. & C. B.....Atlanta, Ga.
Wheeling & Lake Erie R. R. 168 miles.
C. R. Griggs, Lessee & Manager.....Toledo, O.
M. D. Woodford, Gen. Supt...........Toledo, O.
L. James, Gen. M. M................Norwalk, O.
White Water R. R. (See Ft. W., Cin. & Lou.).
Wilmington & No'n R. R. 4-8¾ g. 77 m. 13 lo. 148 c.
J. H. Thompson, Supt. & P. A..Coatesville, Pa.
George Rommel, M. M..........Coatesville, Pa.
Alex. Maitland, M. C. B.........Coatesville, Pa.
Wilmington & Weldon; Northeastern; S. C. Central; Cheraw & Darlington; Cheraw & Salisbury; and Wilmington, Columbia & Augusta R. Rs.
5 g. 599 miles 70 locomotives 1,120 cars.
R. R. Bridgers, Gen. Man....Wilmington, N. C.
J. F. Divine, Gen. Supt.......Wilmington, N. C.
John Bisset, M. M...........Wilmington, N. C.
W. H. Day, M. C. B..............Florence, S. C.
C. R. Clowe, M. C. B. (W.& W.) Wilmington, N. C.
Windsor & Annapolis Ry. 4-8½ g. 130 m. 10 lo. 156 c.
P. Innes, Gen. Man..............Kentville, N. S.
Wm. Yould, M. M................Kentville, N. S.
Wm. Grierson, M. C. B..........Kentville, N. S.
Wisconsin Central R. R. 4-8½ g. 480 m. 49 lo. 1,608 c.
F. N. Finney, Gen. Man........Milwaukee, Wis.
G. Campbell, Pur. Agt..........Milwaukee, Wis.
J. B. Henney, Supt. M. P. & M..Stevens Pt., Wis.
Mil. & E'n Divs.: A. A. Allen, S..Milwaukee, Wis.
W. & No. Div.: C. R. Hanchett, S. Stevens Point, Wis.
Worcester & Nashua; and Nashua & Rochester R. Rs.
4-8½ g. 95 m. 20 lo. 505 cars.
C. S. Turner, Pres. & G. Man. Worcester, Mass.
G. W. Hurlburt, Supt..........Worcester, Mass.
John G. Brady, M. M. & C. B. Worcester, Mass.
Worcester & Shrewsbury R. R. 3 g. 3 miles.
Worcester & Somerset R. R. 4-8½ g. 10 m. 1 lo. 4 c.
J. J. Coburn, Supt.............Worcester, Mass.
G. E. Hapgood, Pur. Agt....Worcester, Mass.
Chas. Cleveland, M. M.......Worcester, Mass.

Y

York & Peach Bottom Ry. 3 g. 39 m. 4 lo. 62 c.
S. M. Manifold, Supt. & Pur. Agt.....York, Pa.
S. J. Williams, M. M.....................York, Pa.
Youghiogheny R. R. 4-9 gauge.
Wm. Wilson, Supt......................Irwin's, Pa.